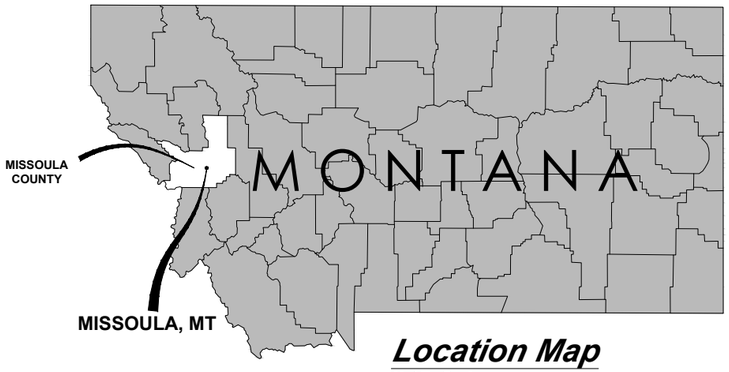
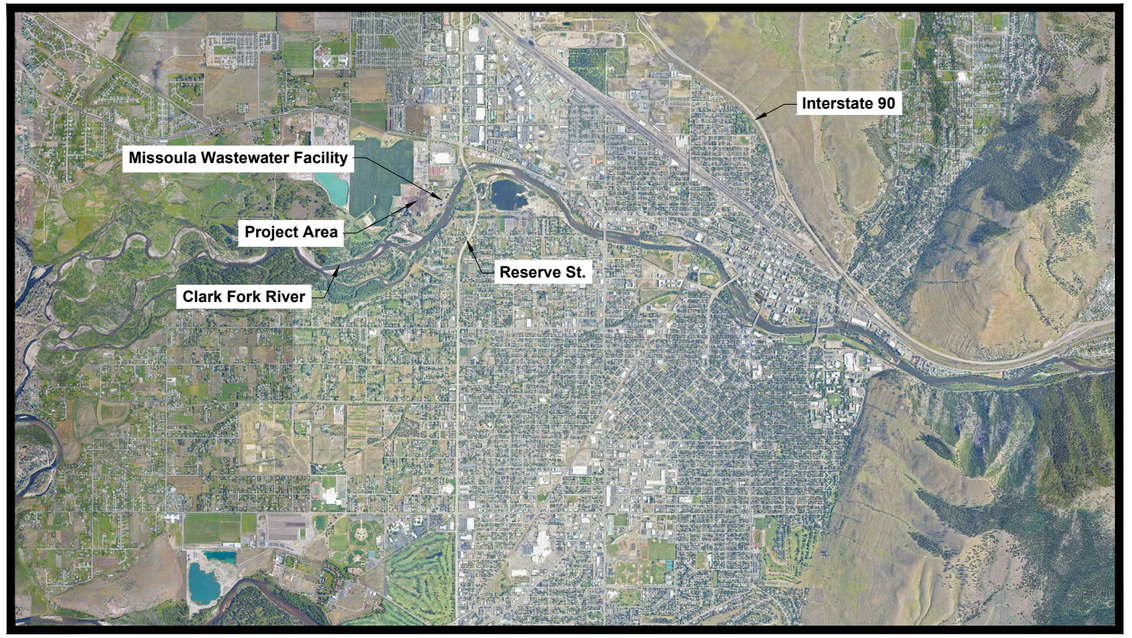
Garden City Compost Facility Improvements
Construction Drawings for the City of Missoula, Montana



Location Map
Not To Scale



MISSOULA, MT MAP

WORKSCOPE

Install New Reversing Air Flow Biosolids & Green Waste Composting Facility with Odor Control, Materials Containment and Curing.

FUNDING SOURCES:

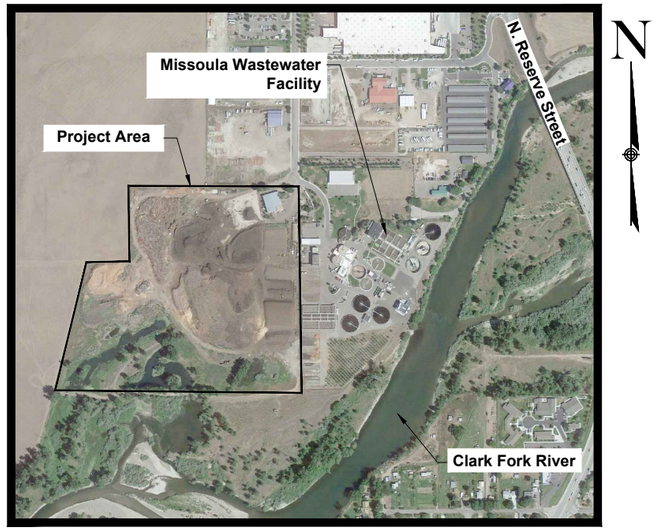
State Revolving Fund Loan Program (MDEQ/MDNRC)

DESIGN CRITERIA:

- **Design Year: 2044**

PROJECT COMPONENTS:

- **Excavation and replacement of unsuitable onsite soils with imported engineered fill**
- **12-bay aerated compost facility with 2 biofilters**
- **Primary sensing equipment and automated controls**
- **Conex control building**
- **Concrete biosolids bin**



FACILITY SITE MAP

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Cover and Project Location**

Sheet: **G-1**

GENERAL

G-1	Cover
G-2	Sheet Index
G-3	Legend
G-4	Abreviations
G-5	Design Criteria
G-6	Process Flow Diagram
G-7	Geotechnical Borehole Locations
G-8	Location and Survey Control Coordinates
G-9	General Project Notes

INSTRUMENTATION AND CONTROL

PID-1	PID Symbols and Legend
PID-2	PID Symbols and Legend
PID-3	Compost Area No. 1 & Biofilter No. 1
PID-4	Compost Area No. 2 & Biofilter No. 2
PID-5	Compost Area Network Diagram

SITE DEMOLITION

D-1	Demolition Plan and Photos
~~D-2~~	~~Transitional Facility Demolition Plan and Photos~~

CIVIL

C-1	Overall Site Grading Plan
C-2	Site Grading Plan - North
C-3	Site Grading Plan - South
C-4	Site Plan
~~C-5~~	~~Rumble Grate Trough Site Plan~~
~~C-6~~	~~Curing Site Plan~~
C-7	Compost Bays and Biofilters Site Plan
C-8	Pre-Compost Containment Bin & Biosolids Bin Site Plan
C-9	Irrigation Well Site Plan
C-10	Plan & Profile - CB-1 to Lift Station
C-11	Plan & Profile - Lift Station to Drying Bed Drain
~~C-12~~	~~Plan & Profile - Biofilter Sump 1 to CB-1~~
~~C-13~~	~~Plan & Profile - Biofilter Sump 2 to CB-3~~
C-14	Plan & Profile - Sump 2 to Runoff Lift Station
~~C-15~~	~~Plan & Profile - E-One LS to LS Forcemain~~
C-16	Runoff Control Plan

CIVIL DETAILS

CD-1	Civil Details
CD-2	Civil Details
CD-3	Civil Details
CD-4	Pipe Supports
CD-5	Manhole Details
CD-6	Catch Basin 1 Details
CD-7	Catch Basin 2 Details
~~CD-8~~	~~Catch Basin 3 Details~~
CD-9	Lift Station Plan
CD-10	Lift Station Section
~~CD-11~~	~~E-One Lift Station Details~~
CD-12	Irrigation Well Details
CD-13	Irrigation Plumbing Diagram

CONTROL BUILDING

CB-1	Control Building Plan
CB-2	Control Building North & South Elevations
CB-3	Control Building East & West Elevations
CB-4	Control Building Anchors

MECHANICAL

M-1	Compost Bays Piping Plan
M-2	Compost Bay Piping Details
M-3	Compost Bay Aeration Piping Details
M-4	Compost Bay Aeration Sections
M-5	Biofilter Bays Piping
M-6	Biofilter 1 Details
M-7	Biofilter 1 Piping Details
M-8	Biofilter Details
~~M-9~~	~~Biofilter 1 Condensate Collection Details~~
M-10	Biofilter 2 Details
M-11	Biofilter 2 Piping Details
~~M-12~~	~~Biofilter 2 Condensate Collection Details~~
~~M-13~~	~~Biofilter 1 Condensate Sump 1 Details~~
~~M-14~~	~~Biofilter 2 Condensate Sump 2 Details~~
M-15	Compost Condensate Collection
M-16	Compost Condensate Collection Section
M-17	Compost Condensate Sump 1 Details
M-18	Foul Air to Biofilter Condensate Collection
M-19	Foul Air to Biofilter Condensate Collection Section
M-20	Condensate Sump 2 Details
M-21	Biofilter 1 Condensate Cleanout Details
M-22	Biofilter 2 Condensate Cleanout Details
M-23	Biofilter Bays Irrigation
~~M-24~~	~~Curing Bays~~
~~M-25~~	~~Curing Bays Sections~~
~~M-26~~	~~Curing Bays Section & Details~~
~~M-27~~	~~Curing Blower & Control Shed Details~~
~~M-28~~	~~Curing Blower Details~~
M-29	Mechanical Details
M-30	Instrument Details

STRUCTURAL

S-1	Structural Notes
S-2	Structural Notes Continued
S-3	Structural Details
S-4	Structural Details
S-5	Structural Details
S-6	Structural Details
S-7	Structural Details
S-8	Structural Details
S-9	Overall Slab On Grade Plan
S-10	Compost Bays Plan
~~S-11~~	~~Biofilters Plan~~
S-12	Push Wall Sections
S-13	Biosolids Bin Details
S-14	Pre-Compost Containment Bin Details
S-15	Biosolids Bin Wall Elevations
S-16	Biosolids Bin Details
~~S-17~~	~~Curing Wall Details~~
~~S-18~~	~~Rumble Grate Trough~~
~~S-19~~	~~Rumble Grate Trough Details~~

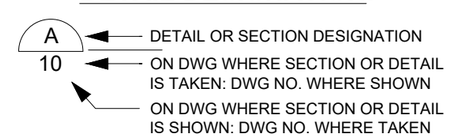
ELECTRICAL

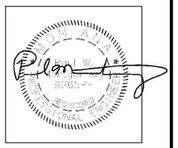
E-0	Schedules and Legend
E-1	Overall Electrical Site Plan
E-2	One-Line Diagram
E-3	Control Building Electrical Plans
E-4	Compost and Biofilter Electrical Plan

DRAWING IDENTIFICATION SYSTEM:

LETTER	DISCIPLINE
G	GENERAL
PID	INSTRUMENTATION AND CONTROL
D	SITE DEMOLITION
C	CIVIL
CD	CIVIL DETAILS
CB	CONTROL BUILDING
M	MECHANICAL
S	STRUCTURAL
E	ELECTRICAL

DETAIL DESIGNATION:





Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

Engineer
Anderson~Montgomery
CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Index**

Sheet: **G-2**

PIPE AND FITTING SYMBOLS

DOUBLE LINE	SINGLE LINE	DESCRIPTION
		EXISTING PIPE (SCREENED)
		NEW PIPE
		EXISTING PIPE TO BE ABANDONED
		EXISTING PIPE TO BE REMOVED
		WELDED JOINT
		GROOVED END JOINT (FLEXIBLE)
		GROOVED END JOINT (RIGID)
		GROOVED END FLANGE
		FLANGED JOINT
		FLANGE COUPLING ADAPTER
		MECHANICAL COUPLING
		ELBOW UP
		ELBOW DOWN
		TEE UP
		TEE DOWN

DOUBLE LINE	SINGLE LINE	DESCRIPTION
		CONCENTRIC REDUCER
		ECCENTRIC REDUCER
		UNION
		BLIND FLANGE
	E	CAP
		CROSS
		TEE
		ELBOW, 45°
		LATERAL (WYE)
		ELBOW, 90°

VALVE SYMBOLS

DOUBLE LINE	SINGLE LINE	DESCRIPTION
		GLOBE
		GATE
		BALL
		PLUG
		BUTTERFLY
		DIAPHRAGM
		PINCH
		SWING CHECK
		DOUBLE DISK CHECK
		BALL CHECK
		AIR DAMPER

DOUBLE LINE	SINGLE LINE	DESCRIPTION
	X	NON FREEZE HOSE VALVE, X=NO IN SPECS
	X	NON FREEZE HOSE VALVE, X=NO IN SPECS
	S	SAMPLE
		PRESSURE RELIEF
		SURGE CONTROL
		AIR/VACUUM
		REGULATED SIDE PRESSURE REDUCING
		PRESSURE REDUCING VALVE
		FLOW CONTROL VALVE / NEEDLE VALVE

CIVIL SYMBOLS

DESCRIPTION	SINGLE LINE	DOUBLE LINE
CONCRETE		
GRAVEL		
PAVEMENT		
CURB AND SIDEWALK		
PROPERTY LINE		
EASEMENT		
RIGHT OF WAY		
GRAVEL ROAD		
CONTOURS	4200 4198	4200 4198
DRAINAGE		
WATER	12"W	W
WATER SERVICE LINE		
WATER SERVICE	S	
SANITARY SEWER		SS MH
STORM DRAIN		
FENCE LINE (BARB WIRE)		
FENCE LINE (CHAIN LINK)		
SIGN		
OVERHEAD POWER	OHPWR	
UNDERGROUND FIBER OPTIC	FO	
UNDERGROUND TELEPHONE, PEDESTAL	PH	
UNDERGROUND GAS	GAS	
UNDERGROUND POWER, TRANSFORMER	PWR	
NATURAL GAS		
HOT WATER		
COLD WATER		
NON-POTABLE WATER		
PLANT AIR		

DESCRIPTION	SINGLE LINE	DOUBLE LINE
CABLE TV	TV	TV
CURB		
DRAINAGE DITCH		
ROAD		
BUILDING		
DROP INLET		
EASEMENT PIN		
POWER POLE		
POWER POLE WITH GUY WIRE		
LIGHT POLE		
SURVEY POINT		
CONTROL POINT	CP	CP
TELEPHONE PED	PED	PED
TELEPHONE BOX		
ELECTRICAL BOX		
CURB BOX, SIGN		
DRILL HOLE OR TEST PIT	DH1 TP1	DH1 TP1
CATTLE GUARD		
SECTION CORNER		
QUARTER CORNER		
FROST FREE HYDRANT		
HOSE BIB		HB
FROST FREE HOSE BIB		FF HB

NOTES:

- CONTACT THE ENGINEER FOR SYMBOLS NOT LISTED.
- THIS IS A STANDARD LEGEND SHEET. THEREFORE, SOME SYMBOLS MAY APPEAR ON THIS SHEET AND MAY NOT BE UTILIZED ON THIS PROJECT.

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Legend**

Sheet: **G-3**

ABBREVIATIONS:

ø	DIAMETER
@	AT
AA	ALL AROUND
AB	ANCHOR BOLT, AGGREGATE BASE
AC	ASBESTOS CEMENT OR ACRE
AFF	ABOVE FINISHED FLOOR
ADA	AMERICANS WITH DISABILITIES ACT
AH	AHEAD
AL	ALUMINUM
ANC	ANCHOR
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
APPROX	APPROXIMATELY
ARV	AIR RELEASE VALVE
AVE	AVENUE
AWWA	AMERICAN WATER WORKS ASSOCIATION
BC	BUILDING CORNER
BF	BLIND FLANGE
BFF	BELOW FINISH FLOOR
BFV	BUTTERFLY VALVE
BGS	BELOW GROUND SURFACE
BK	BACK
BLDG	BUILDING
BLVD	BOULEVARD
BM	BENCH MARK
BOC	BACK OF CURB
BOD	BIOCHEMICAL OXYGEN DEMAND
BV	BALL VALVE
BVC	BEGIN VERTICAL CURVE
C	CHANNEL OR CENTER
CARV	COMBINATION AIR RELEASE VALVE
CATV	CABLE TELEVISION
CF	CUBIC FEET
CFS	CUBIC FEET PER SECOND
CI	CAST IRON OR CURB INLET
CIP	CAST IRON PIPE OR CAST-IN-PLACE
CIPP	CURED-IN-PLACE PIPE
CL	CENTERLINE
CLR	CLEAR
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CO	CLEANOUT
CONC	CONCRETE
COS	CERTIFICATE OF SURVEY
CP	CONTROL POINT
CPE	CORRUGATED POLYETHYLENE PIPE
CPLG	COUPLING
CPVC	CHLORINATED POLYVINYL CHLORIDE
CSP	CORRUGATED STEEL PIPE
CV	CHECK VALVE
CY	CUBIC YARDS
C1D1	CLASS 1 DIVISION 1
CB	CATCH BASIN
DEC	DECANT
DEMO	DEMOLISH
DEPT	DEPARTMENT
DH	DRILL HOLE (SOIL BORING)
DI	DUCTILE IRON OR DRAIN INLET
DIA	DIAMETER
DIMJ	DUCTILE IRON MECHANICAL JOINT
DIP	DUCTILE IRON PIPE
DL	DRAIN LINE
DR	DRAIN OR DIMENSION RATIO
DWAS	DIGESTED WASTE ACTIVATED SLUDGE
DWG	DRAWING
EA	EACH
EFF	EFFLUENT
ELEV	ELEVATION
EOC	EDGE OF CONCRETE
EOP	EDGE OF PAVEMENT
EOS	EDGE OF SIDEWALK
EPDM	ETHYLENE PROPYLENE DIENE M-CLASS RUBBER
EVC	END VERTICAL CURVE
EW	EACH WAY
EXT	EXTERIOR
EXIST	EXISTING
FAB	FABRICATION
FC	FLEXIBLE COUPLING
FCA	FLANGED COUPLING ADAPTER
FDN	FOUNDATION
FETS	FLARED END TERMINAL SECTION
FF	FINISHED FLOOR
FA	FOUL AIR
FG	FINISH GRADE
FH	FIRE HYDRANT
FL	FLOOR, FLANGE OR FLOW LINE
FOC	FACE OF CURB OR FACE OF CONCRETE
FM	FORCE MAIN
FPT	FEMALE PIPE THREAD
FS	FINISHED SURFACE
FTG	FOOTING
FT	FOOT OR FEET
G	GAS
GA	GAUGE
GALV	GALVANIZED
GPD	GALLONS PER DAY
GPM	GALLONS PER MINUTE
GPS	GLOBAL POSITIONING SYSTEM, GALLONS PER SECOND
GSP	GALVANIZED STEEL PIPE
GV	GATE VALVE
GW	GREEN WASTE
HD	HEAVY DUTY OR HOT-DIPPED
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HDR	HEADER
HGT	HEIGHT
HP	HORSEPOWER
HT	HEIGHT
HWY	HIGHWAY
HYD	HYDRANT
I&C	INSTRUMENTATION & CONTROL
IBC	INTERNATIONAL BUILDING CODE
ID	INSIDE DIAMETER
IN	INCH
INFL	INFLUENT
INT	INTERIOR OR INTERSECTION
INV	INVERT
JT	JOINT
K	KILOMETER
KW	KILOWATT
L	ANGLE, LONG
LB(S)	POUND(S)
LD	LOCAL DISCONNECT
LEB	LARGE END BELL
LF	LINEAL FOOT OR LINEAR FEET
LT	LEFT
LS	LIFT STATION
MAX	MAXIMUM
MC	MECHANICAL COUPLING
MCC	MOTOR CONTROL CENTER
MDT	MONTANA DEPT. OF TRANSPORTATION
MECH	MECHANICAL
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM OR MINUTE
MJ	MECHANICAL JOINT
MPT	MALE PIPE THREAD
MPWSS	MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS
MTL	MATERIAL
MWS	MAXIMUM WATER SURFACE
N	NORTH
NEC	NATIONAL ELECTRICAL CODE
N.I.C.	NOT IN CONTRACT
NO.	NUMBER
NPT	NATIONAL PIPE THREAD
NPW	NON-POTABLE WATER
NTS	NOT TO SCALE
OAL	OVERALL LENGTH
OC	ON CENTER
OD	OUTSIDE DIAMETER
OF	OUTSIDE FACE OR OVERFLOW
OHP	OVERHEAD POWER
PC	POINT OF CURVATURE
PE	PLAIN END
PH	PHONE
PI	POINT OF INTERSECTION
PL	PROPERTY LINE OR PLATE
PLCS	PLACES
PROP	PROPERTY OR PROPOSED
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH, GAUGE
PT	POINT OF TANGENCY
PVC	POLYVINYL CHLORIDE PLASTIC
PVI	POINT OF VERTICAL INTERSECTION
PWR	POWER
R	RADIUS
RCB	REINFORCED CONCRETE BOX
RCP	REINFORCED CONCRETE PIPE
RCPA	REINFORCED CONCRETE PIPE ARCHED
RDCR	REDUCER
RFC	ROTATED FOR CLARITY
ROW	RIGHT-OF-WAY
RPA	ROBERT PECCIA & ASSOCIATES
RPC	RED PLASTIC CAP
RPP	REINFORCED POLYPROPYLENE
RR	RAILROAD
RT	RIGHT
RW	RIGHT-OF-WAY OR RACEWAY
R/W	RIGHT-OF-WAY
RWL	RAIN WATER LEADER
S	SLOPE
SBB	SLUDGE BUFFER BASINS
S/C	SERVICE CONNECTION
SCH	SCHEDULE
SD	STORM DRAIN
SDI	STORM DRAIN INLET
SDR	STANDARD DIMENSION RATIO
SEB	SMALL END BELL
SECT	SECTION
SF	SQUARE FOOT/FEET
SIM	SIMILAR
SQFT	SQUARE FOOT/FEET
SS	SANITARY SEWER OR STAINLESS STEEL
SSMH	SANITARY SEWER MANHOLE
SSP	SPIRAL STEEL PIPE
ST	STREET
STA	STATION
STD	STANDARD
STL	STEEL OR STEEL PIPE
SUPER	SUPERNATENT
SY	SQUARE YARDS
T	TELEPHONE
TBC	TOP BACK OF CURB
TBLAY	TOP BACK OF LAYDOWN CURB
TBM	TEMPORARY BENCH MARK
TDW	TREATED DISINFECTED WATER
TEMP	TEMPERATURE OR TEMPORARY
THD	THREAD
TOA	TOP OF ASPHALT
TOC	TOP OF CONCRETE
TOG	TOP OF GRATE
TOS	TOP OF SIDEWALK
TOW	TOP OF WALL
TP	TEST PIT
TS	TECHNICAL SPECIFICATIONS
TV	CABLE TELEVISION
TW	TREATED WATER
TWAS	THICKENED WASTE ACTIVATED SLUDGE
TYP	TYPICAL
UBC	UNIFORM BUILDING CODE
UG	UNDERGROUND
UGP	UNDERGROUND POWER
UPC	UNIFORM PLUMBING CODE
V	VENT, VOLT OR VALVE
VERT	VERTICAL
VFA	VOLATILE FATTY ACID
VLV	VALVE
VPC	VERTICAL POINT OF CURVATURE
VPT	VERTICAL POINT OF TANGENCY
VTR	VENT THROUGH ROOF
W	WATER OR WEST
W/	WITH
W/O	WITHOUT
WAS	WASTE ACTIVATED SLUDGE
WLC	WATER LEVEL CONTROL
WS	WATER SURFACE OR WATER STOP
WSO	WATER SERVICE OUTLET
WSP	WELDED STEEL PIPE
WV	WATER VALVE
WW	WASTEWATER
WWF	WELDED WIRE FABRIC
X	USED AS A VARIABLE
XING	CROSSING
YD	YARD
YPC	YELLOW PLASTIC CAP

NOTES:

- CONTACT THE ENGINEER FOR ABBREVIATIONS NOT LISTED.
- THIS IS A STANDARD ABBREVIATIONS SHEET. THEREFORE, SOME ABBREVIATIONS MAY APPEAR ON THIS SHEET AND MAY NOT BE UTILIZED ON THIS PROJECT.

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

Engineer
Anderson~Montgomery
CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Abbreviations**

Sheet: **G-4**

DESIGN CRITERIA FOR MISSOULA WWTP BIOSOLIDS COMPOSTING FACILITY			
Design Year	2044		
Description	**Parameter**	**Units**	**Design Value**
Materials			
Biosolids Quantity	Calendar Days	Dry Tons/Day	7.3
	5 Day/Week Operating Days	Dry Tons/Day	10.2
	Calendar Days	Wet Tons/Day	47
	5 Day/Week Operating Days	Wet Tons/Day	66
Biosolids Characteristics	Solids Content	% Total Solids	15.5
	Volatile Solids	% Volatile Solids	80
	Bulk Density	Pounds/Cubic Yard	1600
New Bulking Agent	Solids Content	% Total Solids	65
	Bulk Density	Pounds/Cubic Yard	450
Compost	Solids Content	% Total Solids	60
	Bulk Density	Pounds/Cubic Yard	900
Mixing			
Batch Mixer	Operational Schedule	Hours/Day (5 Day Operations)	4
Composting			
Initial Mix Characteristics	Solids Content	% Total Solids	40
	Bulk Density	Pounds/Cubic Yard	880
Detention Time	Calendar Days		21
	Working Weeks		3
Pile Dimensions	Base Depth	Feet	1
	Mix Height	Feet	10
	Cover Height	Feet	1
	Total Height	Feet	12
Aeration	Method	Positive or Negative	Negative
	Capacity	Cubic Feet Per Hour/Dry Ton	5000

DESIGN CRITERIA FOR MISSOULA WWTP BIOSOLIDS COMPOSTING FACILITY CONTINUED			
Description	**Parameter**	**Units**	**Design Value**
Screening			
Portable Screen			
Screen Type	Trommel		Trommel
Screen Size		Inches	3 / 8
Feed Capacity		Cubic Yards/Hour	>50
Redundant Unit			Yes
Curing			
Detention Time	Calendar Days		30
	Working Days		4
Pile Dimensions	Base Depth	Feet	0
	Mix Height	Feet	10
	Cover Height	Feet	0
	Total Height	Feet	10
Aeration	Method	Positive or Negative	Positive
	Capacity	Cubic Feet Per Hour/Dry Ton	1200
Storage			
Biosolids Receiving Bunker		Operational Days	0.5
Bulking Agent Uncovered 10'		Operational Days	20
Recycled Bulking Agent Uncovered		Operational Days	1
Compost Product Uncovered		Calendar Days	90
Odor Control			
Compost Process Exhaust		Continuous	Yes
Biofilter Dilution Air Ratio		% Dilution Air	300
Biofilter Empty Bed Contact Time		Seconds	60
Biofilter Depth		Feet	6

SUMMARY OF PROJECT IMPROVEMENTS
(Not all-inclusive)

BASE BID

- Excavation of unsuitable materials and engineered structural backfill within compost facility footprint
- 12-Bay, reversing airflow composting facility - concrete back wall and slab; in-floor aeration; runoff collection; condensate collection; blowers; dampers; fittings
- Two Biofilters, above ground air delivery; condensate collection; blowers; dampers; fittings; irrigation system; groundwater well & controls
- Conex Control Building - complete compost control system; primary sensing devices; HMI; motor controls; electrical; HVAC
- Runoff Lift Station - submersible pump station to deliver contact runoff to the POTW drying bed drain to headworks
- Biosolids Bin - concrete walls and slabs
- Pre-Compost Bin - concrete slab

ADDITIVE ALTERNATE A

- Concrete working apron

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

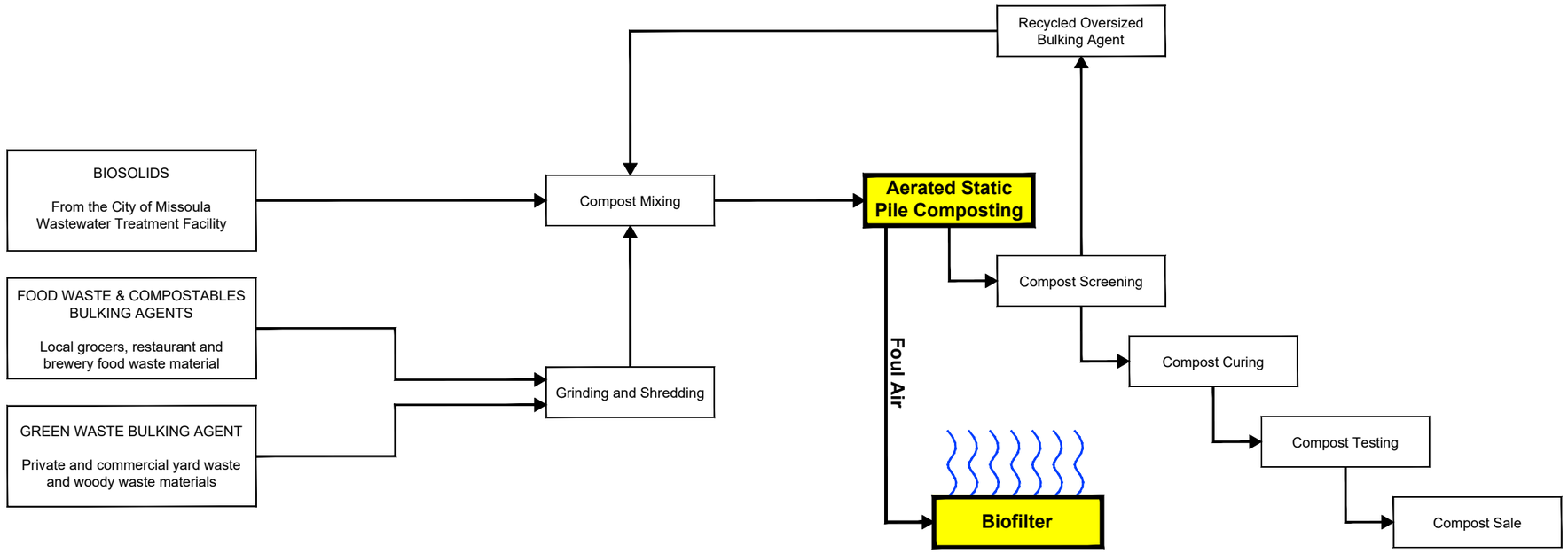
Engineer
Anderson~Montgomery
CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Design Criteria**

Sheet: **G-5**



Compost Facility Process Flow Diagram

NO SCALE

Current Project Scope Elements

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Owner: City Of Missoula

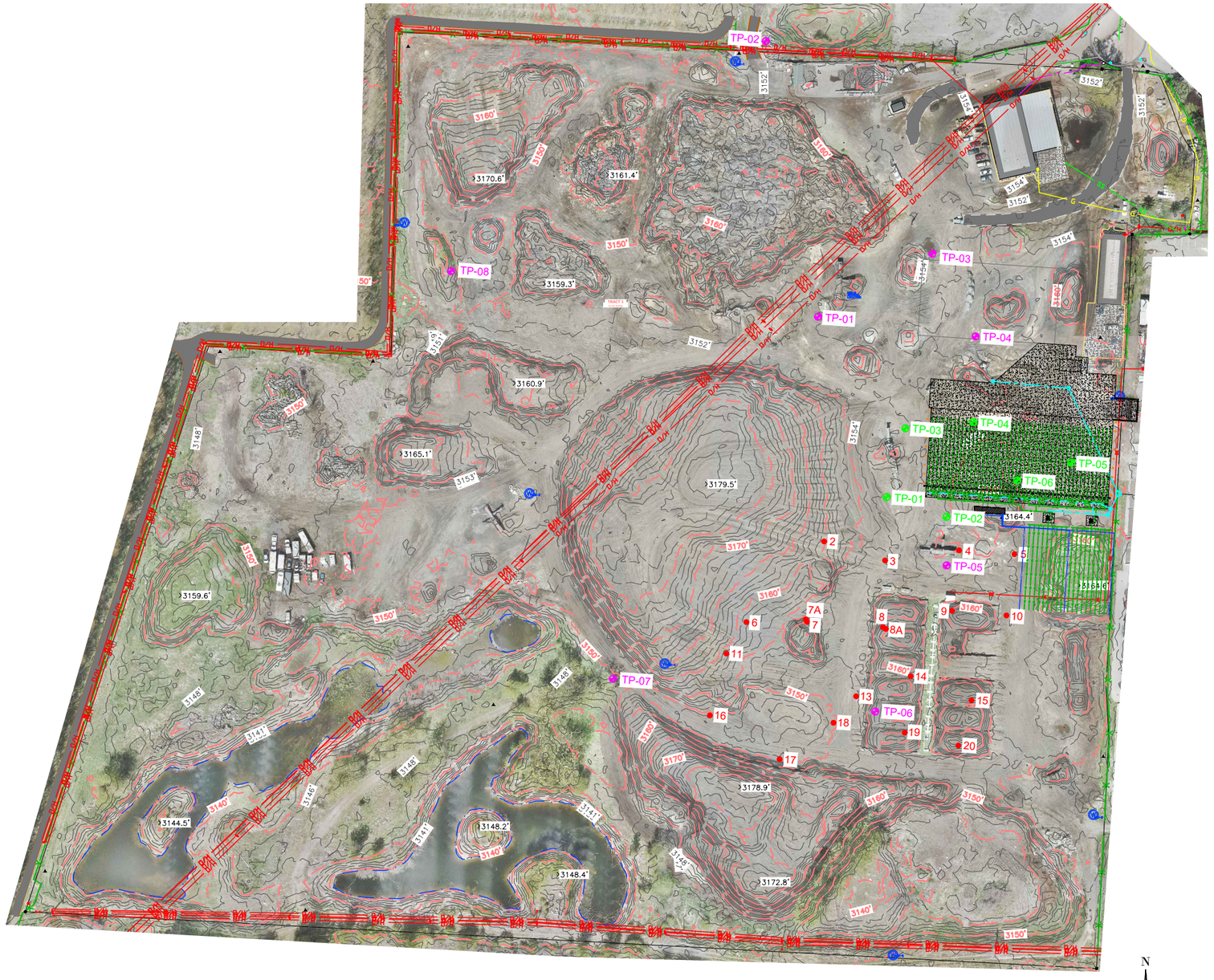
Project Title: Garden City Compost Facility Improvements

Sheet Title: **Compost Facility Process Flow Diagram**

Sheet: **G-6**

NOTES:

- **GEOTECHNICAL REPORT INCLUDED IN APPENDIX C OF THE CONTRACT DOCUMENTS.**



LEGEND:

- 1 - BOREHOLES
- TP-01 - TEST PITS
- TP-01 - TEST PITS

Borehole Locations

80 40 0 80 160
Feet

N

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Geotechnical Borehole Locations**

Sheet: **G-7**

X:\MISSOULA COMPOST\DESIGN\DRAWINGS RE-BID\Sheets\1 - General\G-7 Geotechnical Borehole Locations.dwg SAVED:4/22/25 PRINTED:5/7/25 BY:ADAM

SURVEY CONTROL
MODIFIED STATE PLANE COORDINATES (FEET) - MONTANA 2500
SCALED TO GROUND AT POINT 304
BY SCALE FACTOR 1.000753

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
51	992140.92	832940.71	3152.54	SET NAIL
52	992149.79	832505.60	3150.12	SET NAIL
53	991736.00	832459.36	3149.07	SET NAIL
54	991748.41	832257.95	3149.68	SET NAIL
55	991065.16	832028.04	3148.66	SET NAIL
56	991013.85	832370.54	3149.29	SET NAIL
57	991284.01	832617.67	3146.53	SET NAIL
58	991215.96	833419.67	3156.32	SET NAIL
59	991767.05	833415.70	3155.14	SET MAG NAIL IN CONCRETE
60	991947.37	833543.61	3152.64	SET MAG NAIL IN ASPHALT
61	992124.10	833471.77	3152.77	SET MAG NAIL IN ASPHALT
304	992117.08	833477.74	3152.23	FOUND 1 ½" ALUMINUM CAP (AINSWORTH 2923S)

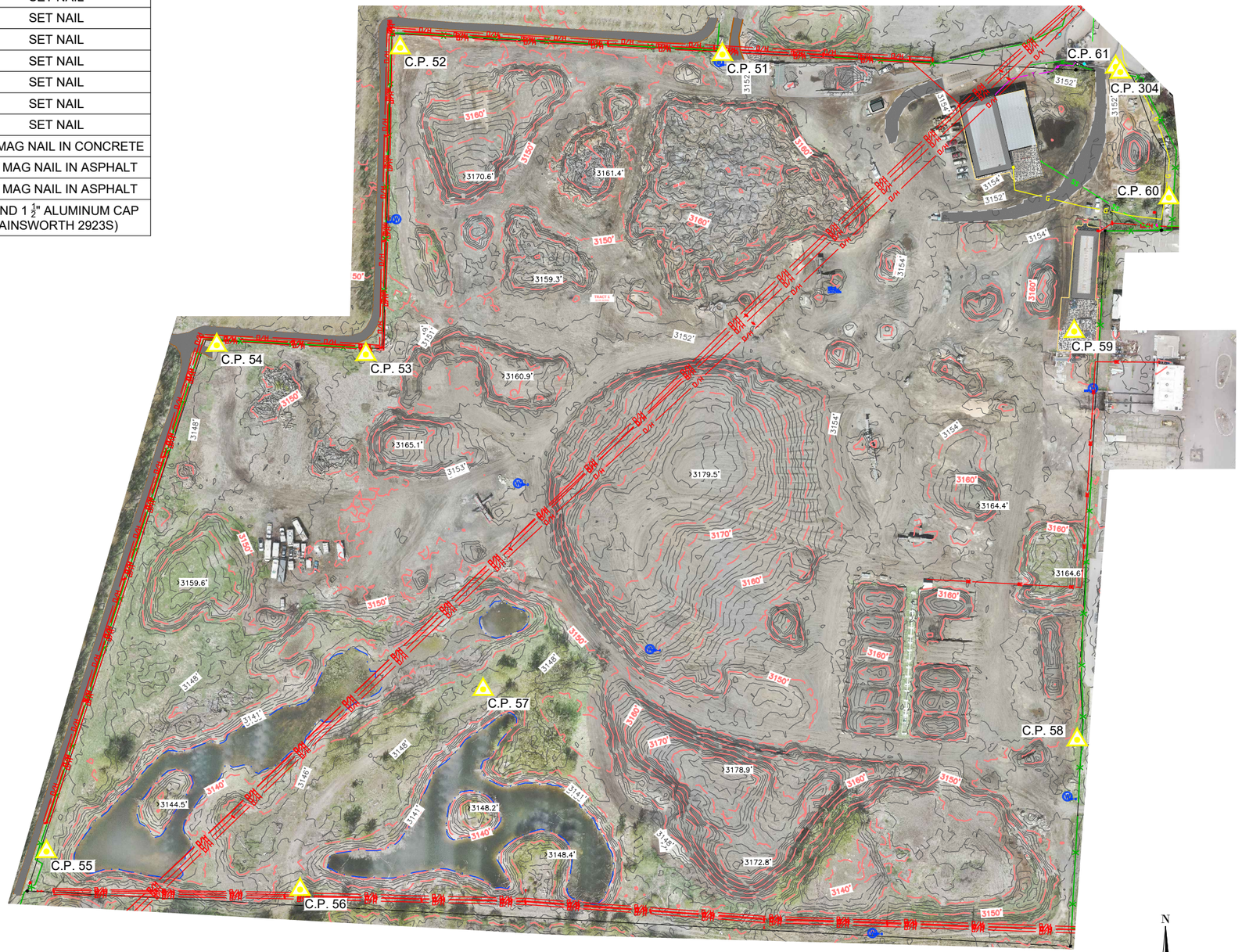
1/4	SEC	T	R
X	18	13N	19W
PRINCIPAL MERIDIAN OF MONTANA			
CITY OF MISSOULA			
MISSOULA COUNTY, MONTANA			

BASIS OF BEARINGS
GRID NORTH OF MONTANA STATE
PLANE COORDINATE SYSTEM
(FIPS 2500)
NAD83 (2011) (EPOCH 2010.00)
(GROUND DISTANCES SHOWN)

VERTICAL DATUM
NAVD 1988
MSOL CORS

SURVEY TIMELINE
INITIAL SURVEY DATE: MAY 9, 2024
PLOT DATE: JUNE 14, 2024

NOTE:
Awarded Contractor will be provided with the AutoCAD file for survey & locating purposes. Contractor will be responsible for accurately locating all new facility improvements.



Location and Survey Control Coordinates

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

Engineer
Anderson~Montgomery
CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Location and Survey Control Coordinates**

Sheet: **G-8**

X:\MISSOULA COMPOST\DESIGN\DRAWINGS RE-BID\Sheets\1 - General\G-8 Location and Survey Control Coordinates.dwg SAVED: 4/22/25 PRINTED: 5/7/25 BY: ADAM

GENERAL NOTES:

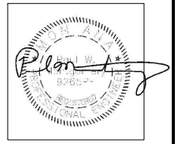
1. CONTRACTOR TO OBTAIN ALL REQUIRED PERMITS FOR CONSTRUCTION, DEWATERING AND STORMWATER DISCHARGES.
2. AS CONSTRUCTED ELEVATIONS SHALL BE WITHIN 0.08' OF ELEVATION SPECIFIED ON THE PLAN DRAWINGS.
3. CONTRACTOR SHALL PROTECT AND PRESERVE ALL EXISTING SITE FEATURES (INCLUDING VEGETATION, SURFACES, STRUCTURES, SURVEY MONUMENTATION, ETC.) TO THE GREATEST EXTENT POSSIBLE DURING CONSTRUCTION. ANY DAMAGE TO EXISTING SITE FEATURES SHALL BE REPAIRED TO ORIGINAL OR BETTER CONDITION AT NO ADDITIONAL COST TO THE OWNER.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING SEWER MAIN SIZE, MATERIAL TYPE, MANHOLE SIZE, MATERIALS AND CONDITION PRIOR TO INITIATION OF SEWER SYSTEM WORK.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER DUST CONTROL DURING CONSTRUCTION.
6. CONTRACTOR MUST COMPLY WITH CITY OF MISSOULA REQUIREMENTS FOR CONSTRUCTION CONTRACTORS. SEE SPECIAL PROVISIONS.

NOTES FOR WATER AND SEWER MAINS:

1. THE OWNER AND RESIDENTS SHALL BE NOTIFIED PRIOR TO CHANGE OR DISRUPTION OF WATER OR SEWER SYSTEM OPERATION.
2. AERATION PIPING SHALL BE BUTT-FUSED HDPE DR17 UNLESS SPECIFICALLY CALLED OUT OTHERWISE IN THE PROJECT DRAWINGS.
3. SEWER MAIN PIPING SHALL BE DUCTILE IRON OR SDR-35 PVC SEWER PIPE.
4. ALL WATERMAIN AND FORCEMAIN FITTINGS, INCLUDING WYES, REDUCERS AND ELBOWS EQUAL TO OR GREATER THAN 22-1/2° SHALL BE RESTRAINED MECHANICAL JOINT. ALL MECHANICAL JOINT RESTRAINTS SHALL BE "MEGALUG", UNIFLANGE OR EQUAL. JOINT RESTRAINT SHALL BE IN ADDITION TO MEETING THRUST BLOCK REQUIREMENTS IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND MPW STANDARD DRAWINGS 02660-1, AND 02660-3.
5. TRENCHES FOR THE INSTALLATION OF WATER MAINS AND SEWER MAINS SHALL BE PROPERLY BACKFILLED AS QUICKLY AS POSSIBLE, BUT NO MORE THAT 48-HOURS AFTER INITIAL DIGGING.
6. WHEN WORKING NEAR AND/OR EXPOSING EXISTING UTILITIES AND SERVICE LINES, WORKERS SHALL UTILIZE HAND-DIGGING IN ORDER TO AVOID DAMAGE TO THOSE UTILITIES. IF DAMAGE OCCURS, THE COST OF REPAIR AND PENALTIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

UTILITY NOTES:

1. THE ENGINEER HAS OBTAINED UNDERGROUND UTILITY INFORMATION FROM OWNERS OF THE UNDERGROUND FACILITIES AND INCLUDED THAT INFORMATION AS PART OF THESE PLANS. THIS UTILITY LOCATION INFORMATION IS APPROXIMATE AND MAY BE INCOMPLETE.
2. BEFORE BEGINNING AN EXCAVATION, THE CONTRACTOR SHALL NOTIFY, THROUGH ONE-CALL NOTIFICATION CENTER, ALL OWNERS OF UNDERGROUND FACILITIES IN THE AREA OF THE PROPOSED EXCAVATION. THE PHONE NUMBER IS: **1-800-424-5555 OR 811. WEBSITE: WWW.CALLBEFOREYOUDIG.ORG**
3. AFTER AN OWNER OF AN UNDERGROUND FACILITY HAS LOCATED AND MARKED THE UNDERGROUND FACILITIES, THE CONTRACTOR SHALL DETERMINE IF WEATHER, TIME, OR OTHER FACTORS MAY HAVE AFFECTED LOCATION MARKS, WARRANTING RELOCATION OF THE FACILITIES.
4. IF EXCAVATION HAS NOT OCCURRED WITHIN 30 DAYS OF THE LOCATE AND MARK, THE CONTRACTOR SHALL REQUEST THAT THE FACILITY BE RELOCATED AND REMARKED BEFORE EXCAVATING UNLESS OTHER ARRANGEMENTS HAVE BEEN MADE WITH THE UNDERGROUND FACILITY OWNER. THE CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH RELOCATING AND REMARKING A FACILITY THAT IS NOT EXCAVATED WITHIN 30 DAYS OF THE LOCATE AND MARK.
5. THE CONTRACTOR MAY NOT BEGIN EXCAVATING BEFORE THE LOCATING AND MARKING IS COMPLETE OR BEFORE THE CONTRACTOR IS NOTIFIED THAT LOCATING AND MARKING IS UNNECESSARY.
6. THE CONTRACTOR SHALL LOCATE AND MARK THE AREA TO BE EXCAVATED IF REQUESTED BY THE UNDERGROUND FACILITY OWNER OR THEIR REPRESENTATIVE. IF THE CONTRACTOR DISCOVERS AN UNDERGROUND FACILITY THAT HAS NOT BEEN LOCATED AND MARKED, THE CONTRACTOR SHALL STOP EXCAVATING IN THE VICINITY OF THE FACILITY AND NOTIFY THE FACILITY OWNER OR THE ONE-CALL NOTIFICATION CENTER. IF THIS OCCURS THE CONTRACTOR SHALL PROCEED WITH OTHER ELEMENTS OF THE PROJECT, AT NO COST TO THE PROJECT OWNER, UNTIL THE UNDERGROUND FACILITY OWNER HAS NOTIFIED THE CONTRACTOR THAT EXCAVATION CAN PROCEED.



Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

Engineer

Anderson~Montgomery
CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Owner: City Of Missoula

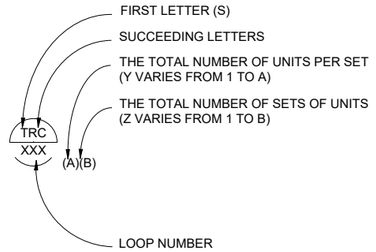
Project Title: Garden City Compost Facility Improvements

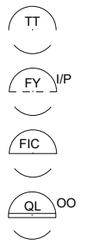
Sheet Title: **General Project Notes**

Sheet: **G-9**

INSTRUMENT IDENTIFICATION

EXAMPLE SYMBOLS





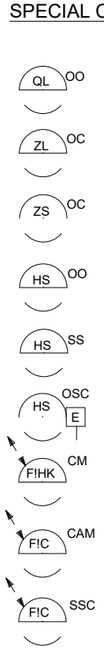
FIELD MOUNTED INSTRUMENT

REAR-OF-PANEL MOUNTED INSTRUMENT

PANEL MOUNTED INSTRUMENT

MOTOR CONTROL CENTER MOUNTED INSTRUMENT

SPECIAL CASES



ON AND OFF EVENT LIGHTS

OPENED AND CLOSED POSITION LIGHTS

OPENED AND CLOSED POSITION SWITCHES

ON-OFF HAND SWITCH. MAINTAINED CONTACT SWITCH (CONTROLLED DEVICE WILL RESTART ON RETURN OF POWER AFTER POWER FAILURE).

STOP-START HAND SWITCH MOMENTARY CONTACT SWITCHES (CONTROLLED DEVICE WILL NOT RESTART ON RETURN OF POWER AFTER POWER FAILURE).

ELECTRIC ACTUATOR WITH INTEGRAL OPEN-STOP-CLOSE MOMENTARY CONTACT CONTROL SWITCH

FLOW INDICATING, COMPUTER/MANUAL CONTROL STATION

FLOW INDICATING, COMPUTER/AUTO/MANUAL CONTROL STATION

FLOW INDICATING SUPERVISORY SET POINT (BY COMPUTER) , AUTO/MANUAL CONTROL STATION

COMPUTER, ACCESSIBLE TO THE OPERATER

PROGRAMMABLE LOGIC CONTROLLER, ACCESSIBLE TO THE OPERATOR

PROGRAMMABLE LOGIC CONTROLLER, INPUT/OUTPUT (I/O) X=TOTAL NUMBER OF INPUT/OUTPUT POINTS

TRANSDUCERS

A	ANALOG	I	CURRENT
D	DIGITAL	P	PNEUMATIC
E	VOLTAGE	PF	PULSE FREQUENCY
F	FREQUENCY	PD	PULSE DURATION
H	HYDRAULIC	R	RESISTANCE

EXAMPLE:

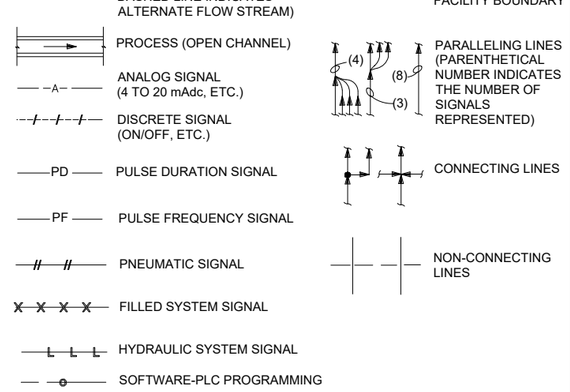
CURRENT TO PNEUMATIC TRANSDUCER (BACK OF PANEL, IN A FLOW LOOP)

INSTRUMENT SOCIETY OF AMERICA TABLE

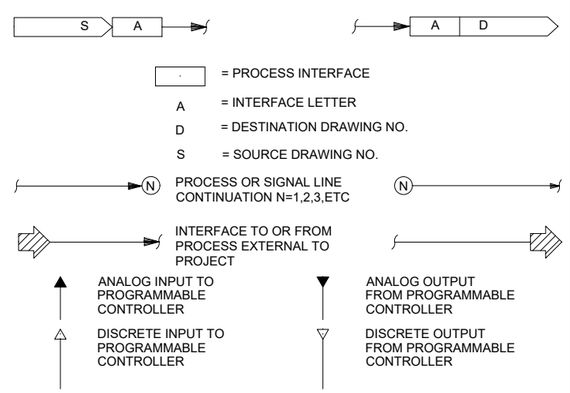
LETTER	FIRST LETTER (S)		SUCCEEDING LETTERS		
	PROCESS OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS (+)		ALARM		
B	BURNER FLAME		USERS CHOICE (+)	USERS CHOICE (+)	USERS CHOICE (+)
C	CONDUCTIVITY			CONTROL	
D	DENSITY (S.G)	DIFFERENTIAL			
E	VOLTAGE		PRIMARY ELEMENT		
F	FLOW RATE	RATIO			
G	GAUGE		GLASS	GATE	
H	HAND (MANUAL)				HIGH
I	CURRENT		INDICATE		
J	POWER	SCAN			
K	TIME OR SCHEDULE			CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW
M	MOTION				MIDDLE
N	USERS CHOICE (+)		USERS CHOICE (+)	USERS CHOICE (+)	USERS CHOICE (+)
O	USERS CHOICE (+)		ORIFICE		
P	PRESSURE (OR VACUUM)		POINT (TEST CONNECTION)		
Q	QUANTITY OR EVENT(+)	INTEGRATE	INTEGRATE		
R			RECORD OR PRINT		
S	SPEED OR FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE (+)		MULTIFUNCTION (+)	MULTIFUNCTION (+)	MULTIFUNCTION (+)
V	VISCOSITY			VALVE OR DAMPER	
W	WEIGHT OR FORCE		WELL		
X	UNCLASSIFIED (+)		UNCLASSIFIED (+)	UNCLASSIFIED (+)	UNCLASSIFIED (+)
Y	USERS CHOICE (+)			RELAY OR COMPUTE (+)	
Z	POSITION			DRIVE, ACTUATE OR UNCLASSIFIED FINAL CONTROL ELEMENT	

(+) WHEN USED, EXPLANATION IS SHOWN ADJACENT TO INSTRUMENT SYMBOL. SEE ABBREVIATIONS AND LETTER SYMBOLS.

LINE LEGEND



INTERFACE SYMBOLS



ABBREVIATIONS & LETTER SYMBOLS

AC	ALTERNATING CURRENT
ACK	ACKNOWLEDGE ALARM
ALKY	ALKALINITY
AM	AUTO-MANUAL
CAM	COMPUTER-AUTO-MANUAL
CCS	CENTRAL CONTROL SYSTEM
CL_2 etc.	CHLORINE (TYPICAL: USE STANDARD CHEMICAL ELEMENT ABBREVIATION)
CM	COMPUTER-MANUAL
COD	CHEMICAL OXYGEN DEMAND
CP-X	CONTROL PANEL NO. X
DC	DIRECT CURRENT
DO	DISSOLVED OXYGEN
D	DRAIN
FA	FOUL AIR
FCL_2	FREE CHLORINE RESIDUAL
FOS	FAST-OFF-SLOW
FOSA	FAST-OFF-SLOW-AUTO
FOSR	FAST-OFF-SLOW-REMOTE
FP-W-X	FIELD PANEL NO. WX (W = UNIT PROCESS NUMBER X = PANEL NUMBER)
FR	FORWARD-REVERSE
HDNS	HARDNESS
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
LEL	LOWER EXPLOSIVE LIMIT
LOS	LOCKOUT STOP
LR	LOCAL-REMOTE
MA	MANUAL-AUTO
MBAS	METHYLENE BLUE ACTIVE SUBSTANCES
MC	MODULATE-CLOSE
MCC-X	MOTOR CONTROL CENTER NO. X
OC	OPEN-CLOSE (D)
OCR	OPEN-CLOSE-REMOTE
OCA	OPEN-CLOSE-AUTO
OO	ON-OFF
OOA	ON-OFF-AUTO
OOR	ON-OFF-REMOTE
OP	ORTHO PHOSPHORUS
ORP	OXIDATION REDUCTION POTENTIAL
OSC	OPEN-STOP-CLOSE
pH	HYDROGEN ION CONCENTRATION
RM-X	REMOTE MULTIPLEXING MODULE NO. X
RTU-X	REMOTE TELEMETRY UNIT NO. X
SF	SLOWER-FASTER
SS	START-STOP
SSC	SUPERVISORY SET POINT CONTROL
TCL_2	TOTAL CHLORINE RESIDUAL
TOC	TOTAL ORGANIC CARBON
TOD	TOTAL OXYGEN DEMAND
TURB	TURBIDITY
UD	UP-DOWN
VHC	VOLATILE HYDROCARBONS
VIB	VIBRATION
Δ	DIFFERENCE
Σ	SUM
X	MULTIPLY
$\div$	DIVIDE
f(x)	CHARACTERIZED
X^n	RAISE TO THE Nth POWER
$\sqrt{\ }$	SQUARE ROOT
AVG	AVERAGE
1:1	REPEAT OR BOOST
>	SELECT HIGHEST SIGNAL
<	SELECT LOWEST SIGNAL
	BIAS
%	GAIN OR ATTENUATE

GENERAL NOTES

1. COMPONENTS AND PANELS SHOWN WITH A SINGLE ASTERISK (*) ARE TO BE PROVIDED AS PART OF A PACKAGE SYSTEM.
2. COMPONENTS SHOWN WITH DOUBLE ASTERISK (**) TO BE FURNISHED UNDER DIVISION 16, ELECTRICAL.
3. THIS IS A STANDARD LEGEND, THEREFORE, NOT ALL OF THIS INFORMATION MAY BE USED ON THIS PROJECT.
4. FUTURE IMPROVEMENTS, NOT INCLUDED IN CURRENT PROJECT SCOPE.

MONTANA KATHLEEN KLACIK No. 72593 PE LICENSED PROFESSIONAL ENGINEER
2/12/25

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: Paul Montgomery, P.E.
Approved By: Katie Klacik, P.E.
Checked By: Michael Montoya, P.E.
Designed By: Kathleen Hutchinson

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Jacobs
999 Main Street
STE. 1200
Boise, ID 83702
Phone (406) 212-4520

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **PID Symbols and Legend**

Sheet: **PID-1**

VALVE SYMBOLS

- AIR DAMPER (XX)
- GATE
- KNIFE GATE (K)
- BUTTERFLY (XX)
- GLOBE
- BALL
- VEE- BALL (V)
- PLUG
- SEAT PORT ECCENTRIC PLUG
- DIAPHRAGM
- PINCH
- NEEDLE
- SWING CHECK
- BALL CHECK
- SAMPLE (S)
- MUD
- PRESSURE RELIEF
- AIR AND / OR VACUUM RELEASE
- REGULATED SIDE PRESSURE CONTROL
- MULTI-PORT VALVES (BALL VALVE SHOWN. FOR OTHER VALVE TYPES, APPROPRIATE VALVE SYMBOL SHOWN.) ARROWS INDICATE FLOW PATTERN. SEAT PORTS ARE IMPLIED BY INDICATED FLOW PATTERN.
- THREE-WAY DIVERTER VALVE
- SPLIT DISK CHECK VALVE

NOTE:
XX
NO = NORMALLY OPEN
NC = NORMALLY CLOSED

GATE SYMBOLS

- SLUICE
- BUTTERFLY
- FLAP
- FABRICATED SLIDE
- SHEAR

ACTUATOR SYMBOLS

- PNEUMATIC W/POSITIONER (P Z XX)
- PNEUMATIC W/SOLENOID (P S XX)
- ELECTRIC (E XX)
- ELECTRIC W/POSITIONER (E Z XX)
- ELECTROHYDRAULIC (EH XX)
- HYDRAULIC (H XX)
- PNEUMATIC WITH VOLUME BOOSTER (P B XX)
- SOLENOID (S)
- MANUAL

NOTE:
ON LOSS OF PRIMARY POWER (PNEUMATIC, ELECTRICAL OR HYDRAULIC)
XX: FO =FAIL OPEN
FC =FAIL CLOSED
FLP=FAIL TO LAST POSITION

PRIMARY ELEMENT SYMBOLS

- PARSHALL FLUME
- WEIR
- ORFICE PLATE
- FLOW TUBE
- PITOT-STATIC (J)
- VORTEX METER
- ROTAMETER
- ULTRASONIC FLOWMETER (INLINE)
- ELECTROMAGNETIC FLOWMETER (M)
- PROPELLER OR TURBINE METER
- DENSITY METER (DE) (X: N = NUCLEAR, O = OPTICAL, U = ULTRASONIC)
- ULTRASONIC FLOWMETER (CLAMP-ON)
- LEVEL (ULTRASONIC) (LE)
- LEVEL (BUBBLER TUBE)
- LEVEL (FLOAT) (LS)
- AIR MASS FLOWMETER

MISCELLANEOUS SYMBOLS

- SIGHT GLASS
- DIAPHRAGM SEAL
- BLIND FLANGE
- AIR GAP
- VENT TO ATMOSPHERE (V)
- AERATOR
- PLUG
- RECEPTACLE
- SELF CONTAINED AIR SUPPLY (A)
- COMPOSITE SAMPLER (DIPPER TYPE) (SD, D)
- COMPOSITE SAMPLER (SUCTION TYPE) (SS)
- TV CAMERA (TV)
- RADIO ANTENNA
- "ON" TIME DELAY B "ON" X-SEC. AFTER A "ON". INSTANT "OFF". (A, ON-TD X-SEC, B)
- "OFF TIME DELAY B "OFF" X-SEC. AFTER A "OFF" INSTANT "ON" (OFF-TD X-SEC)
- (I)
- OR
- INTERLOCK. SEE CONTROL DIAGRAMS (I)
- MEMORY ELEMENT S= SET , R= RESET (A, B, S, R, C)
- PURGE SET (XP) X: W = WATER, A = AIR
- XX — INSTRUMENT AIR SET XX= SUPPLY PRESSURE IN PSIG.
- FILTER/ REGULATOR/ GAUGE SET
- WATER-AIR TRAP (T)
- CALIBRATION COLUMN
- FOUL-AIR TRAP
- 120V — 120 VOLT, 60 HZ POWER
- 480V — 480 VOLT, 60 HZ POWER
- ANNULAR DIAPHRAGM SEAL
- RUPTURE DISK
- PIG INSERT POINT
- PIG CATCH POINT (OR)
- MIXER (OR, M)
- ELECTRIC MOTOR (M)
- PRESSURE GAUGE
- TONE TRANSMITTER NO. X (X)
- TONE RECEIVER NO. X (X)
- VOICE COMMUNICATION POINT
- TV MONITOR (TV)
- LOGIC ELEMENT: IF A AND NOT B THEN C (A, B, AND, C)
- LOGIC ELEMENT: IF A OR B THEN C (A, B, OR, C)
- ON/OFF RELAY. INPUT IS CONNECTED TO OUTPUT WHEN SWITCHING SIGNAL IS PRESENT. (S, R)
- SWITCHING SIGNAL
- SWITCHING RELAY. INPUT WITH DOT IS CONNECTED TO OUTPUT WHEM SWITCHING SIGNAL IS PRESENT (S, R)
- OTHER INPUT IS CONNECTED TO OUTPUT WHEN SWITCHING SIGNAL IS NOT PRESENT.
- FLUSHING CONNECTION/ SAMPLE PORT (F)
- HOSE ADAPTOR
- SEAL WATER SET (S)
- SIGHT FLOW GAUGE
- PULSATION DAMPENER (P)
- QUICK DISCONNECT
- FILTER

PUMP AND COMPRESSOR SYMBOLS

NOTE: XX: AS = ADJUSTABLE SPEED
CS-1 = CONSTANT SPEED (SINGLE SPEED)
CS-2 = CONSTANT SPEED (TWO SPEED)

- CENTRIFUGAL PUMP (DRY PIT) (XX)
- CHEMICAL FEED PUMP (XX)
- DIAPHRAGM PUMP (XX)
- PISTON PUMP (XX)
- PROGRESSIVE CAVITY PUMP (XX)
- SUBMERSIBLE SUMP PUMP (XX)
- COMPRESSOR (PISTON) (XX)
- EJECTOR

CONTROL DIAGRAM SYMBOLS

- CONTROL DEVICE (X)
  X: M = MOTOR STARTER COIL
  S = SOLENOID COIL
  C = RELAY COIL
  T = TIMER
  D = TIME DELAY RELAY
- MISCELLANEOUS EQUIPMENT
- CONTACT NORMALLY OPEN
- CONTACT NORMALLY CLOSED
- GROUND
- HORN
- FIELD COMPONETS
- START — PUSH BUTTON-MOMENTARY SPRING RETURN (OPEN CIRCUIT)
- STOP — PUSH BUTTON-MOMENTARY SPRING RETURN (OPEN CIRCUIT)
- OFF / ON / AUTO / X00 / 00X — SELECTOR SWITCH MAINTAINED (CONTACT BLOCK CONSTRUCTION)
- OPEN / CLOSE — PUSHBUTTON-MAINTAINED MECHANICAL INTERLOCK
- ON / OFF / AUTO — SELECTOR SWITCH MAINTAINED
- INDICATING LIGHT (Y)
- INDICATING LIGHT PUSH-TO-TEST (Y)
  Y= A - AMBER
  B - BLUE
  G - GREEN
  R - RED
- JUNCTION OF CONNECTED PATHS
- CROSSING OF CONDUCTORS NOT CONNECTED
- ANTENNA
- SOLID LINE DENOTES PANEL WIRING
- DASHED LINE DENOTES FIELD WIRING
- TIMER CONTACT- OPENS AT END OF TIME CYCLE (XX)
- TIMER CONTACT- OPENS AT END OF TIME CYCLE (XX)
- TIME DELAY RELAY CONTACT- NORMALLY OPEN (XX)
- TIME DELAY RELAY CONTACT- NORMALLY CLOSED (XX)
  XX:
  TO= TIME TO OPEN
  TC= TIME TO CLOSE
  TDO= TIME DELAY OPENING
  INST= INSTANTANEOUS

FIELD COMPONENTS

- LEVEL SWITCH OPENS ON RISING LEVELS
- LEVEL SWITCH CLOSES ON RISING LEVELS
- PRESSURE OR VACUUM SWITCH OPENS ON RISING PRESSURE
- PRESSURE OR VACUUM SWITCH CLOSES ON RISING PRESSURE
- FLOW SWITCH OPENS ON INCREASING FLOW
- FLOW SWITCH CLOSES ON INCREASING FLOW
- FLOW SWITCH OPENS ON RISING TEMPERATURES
- FLOW SWITCH CLOSES ON RISING TEMPERATURES
- LIMIT SWITCH NORMALLY CLOSED CIRCUIT
- LIMIT SWITCH NORMALLY OPEN CIRCUIT

NOTE:
THIS IS A STANDARD LEGEND SHEET. SOME SYMBOLS OR ABBREVIATIONS MAY APPEAR ON THIS SHEET AND NOT ON THE PLANS.

MONTANA
KATHLEEN KLACIK
No. 72593 PE
LICENSED PROFESSIONAL ENGINEER
2/12/25

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: Paul Montgomery, P.E.
Approved By: Katie Klacik, P.E.
Checked By: Michael Montoya, P.E.
Designed By: Kathleen Hutchinson

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Jacobs
999 Main Street
STE. 1200
Boise, ID 83702
Phone (406) 212-4520

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **PID Symbols and Legend**

Sheet: **PID-2**

CP-100*
PLC-100
REMOTE
RUN
RUN COMMAND
SPEED
SPEED COMMAND
FAULT
REMOTE
RUN
RUN COMMAND
SPEED
SPEED COMMAND
FAULT
(6)
HIGH PANEL TEMPERATURE ALARM
UTILITY POWER OK
PANEL INTRUSION ALARM
ETHERNET FAULT
24 VDC POWER SUPPLY
UPS FAULT
BATTERY LOW
UPS ON BYPASS
UPS POWER FAILURE
TAH 101
XA 101
XA 102
XA 103
XA 104
XA 105
XA 106
XA 107
XA 108
RF MODEM
480V
BIOFILTER DRIVE CABINET 300
COMP-DRV-300*
BIO-VFD-301
480V
BAYS 1-6 DRIVE CABINET 100
COMP-DRV-100*
COMP-VFD-101
COMP-VFD-102
COMP-VFD-103
COMP-VFD-104
COMP-VFD-105
COMP-VFD-106
COOLING AIR
FCV 102
POWER
FV 103
36" FA
30" FA
FV 101
BIOFILTER FAN NO. 1
BIO-FAN-301
NC
A
PID-4
TO COMPOST BAYS 7-12
PI 101*
TI 113*
POWER
8" FA
NC
NO
H
FRESH AIR
COMPOST FAN NO. 1
COMP-FAN-101
COMPOST FAN NO. 2
COMP-FAN-102
COMPOST FAN NO. 3
COMP-FAN-103
COMPOST FAN NO. 4
COMP-FAN-104
COMPOST FAN NO. 5
COMP-FAN-105
COMPOST FAN NO. 6
COMP-FAN-106
SEE NOTE 1
TT 101A* TE 101A*
TT 101B* TE 101B*
TT 101C* TE 101C*
TT 102A* TE 102A*
TT 102B* TE 102B*
TT 102C* TE 102C*
TT 103A* TE 103A*
TT 103B* TE 103B*
TT 103C* TE 103C*
TT 104A* TE 104A*
TT 104B* TE 104B*
TT 104C* TE 104C*
TT 105A* TE 105A*
TT 105B* TE 105B*
TT 105C* TE 105C*
TT 106A* TE 106A*
TT 106B* TE 106B*
TT 106C* TE 106C*
BIOFILTER NO. 1
BIOFILTER-301
BAY NO. 1
BAY NO. 2
BAY NO. 3
BAY NO. 4
BAY NO. 5
BAY NO. 6

GENERAL SHEET NOTES:
1. SEE MECHANICAL SHEETS FOR CONDENSATE COLLECTION PIPING LAYOUT.
2. FUTURE IMPROVEMENTS, NOT INCLUDED IN CURRENT PROJECT SCOPE.

X:\MISSOULA COMPOST\DESIGN\DRAWINGS RE-BID\Sheets\2 - P&ID\PID-3.dwg SAVED: 5/7/25 PRINTED: 5/29/25 BY: ADAM

MONTANA PROFESSIONAL ENGINEER
KATHLEEN KLACIK
No. 72593 PE
LICENSED
2/12/25

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: Paul Montgomery, P.E.
Approved By: Katie Klacik, P.E.
Checked By: Michael Montoya, P.E.
Designed By: Kathleen Hutchinson

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

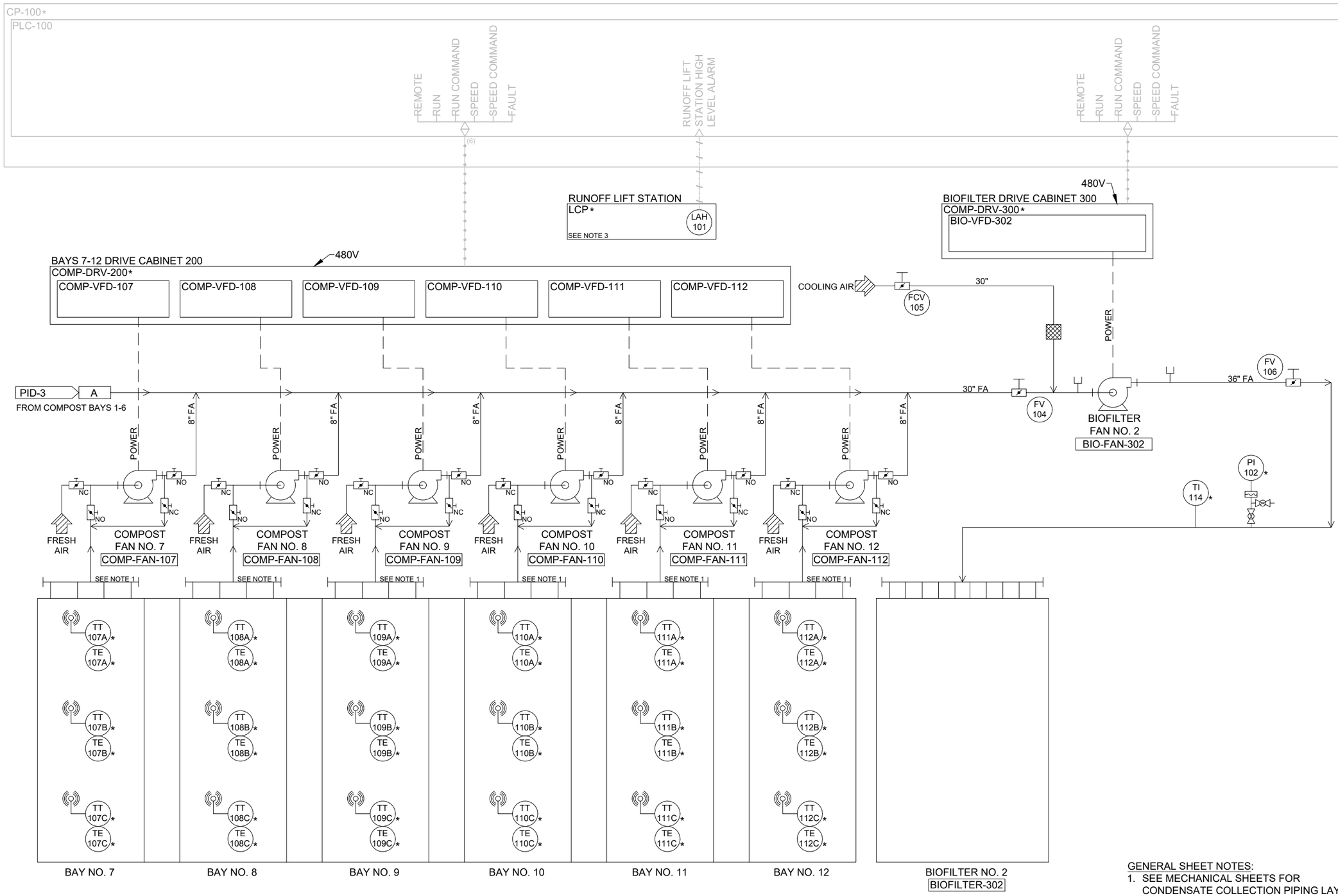
Jacobs
999 Main Street
STE. 1200
Boise, ID 83702
Phone (406) 212-4520

Owner
City Of Missoula

Project Title
Garden City Compost Facility Improvements

Sheet Title
Compost Area No. 1 & Biofilter No. 1

Sheet
PID-3



GENERAL SHEET NOTES:

1. SEE MECHANICAL SHEETS FOR CONDENSATE COLLECTION PIPING LAYOUT.
2. WIRELESS TEMPERATURE RECEIVER SHOWN ON PID-3.
3. PROVIDED WITH LIFT STATION PACKAGE.
4. FUTURE IMPROVEMENTS, NOT INCLUDED IN CURRENT PROJECT SCOPE.

MONTANA PROFESSIONAL ENGINEER
KATHLEEN KLACIK
No. 72593 PE
LICENSED
2/12/25

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: Paul Montgomery, P.E.
Approved By: Katie Klacik, P.E.
Checked By: Michael Montoya, P.E.
Designed By: Kathleen Hutchinson

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Jacobs
999 Main Street
STE. 1200
Boise, ID 83702
Phone (406) 212-4520

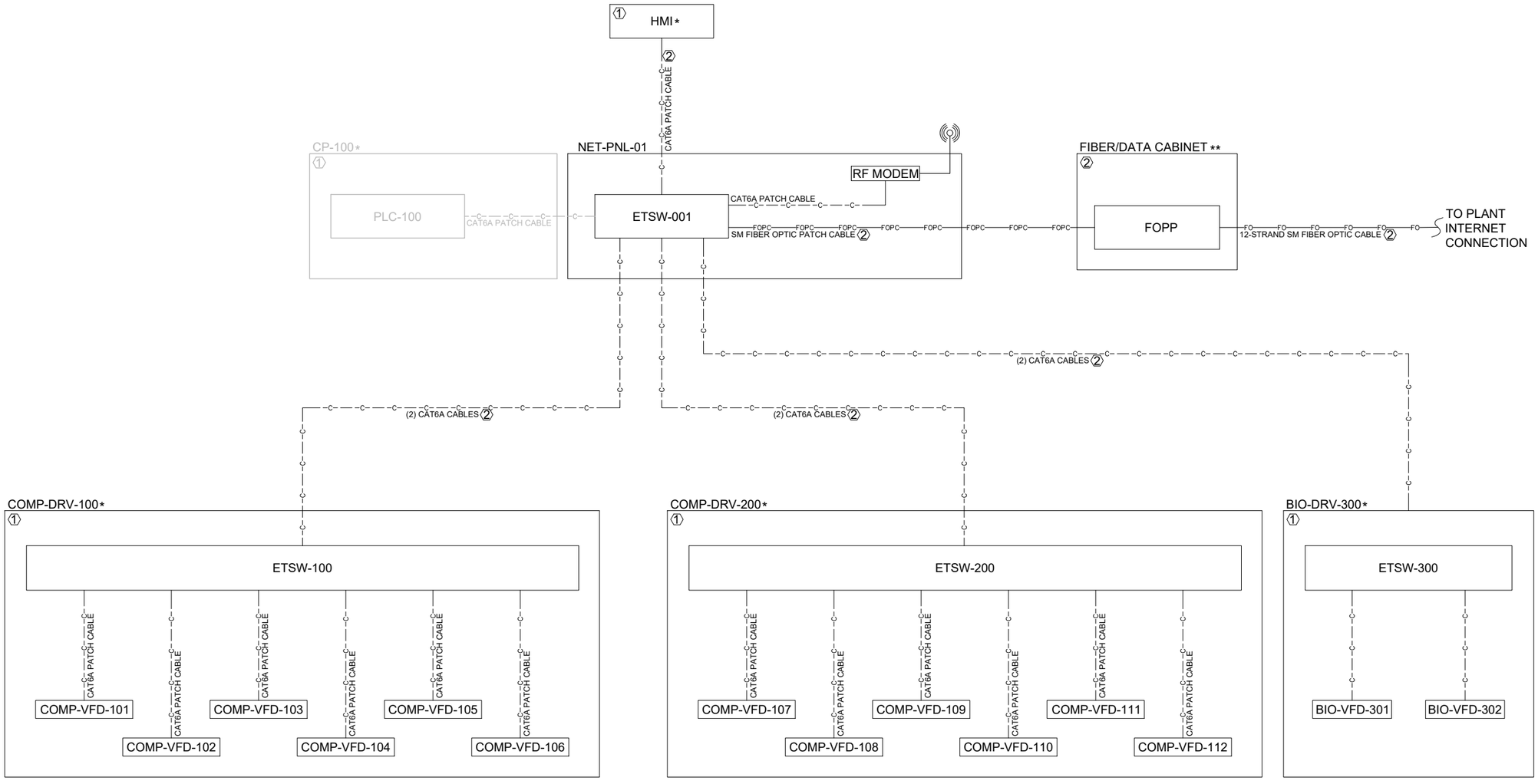
Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Compost Area No. 2 & Biofilter No. 2**

Sheet: **PID-4**

KEYED NOTES:
① - PROVIDED BY THE PIC SYSTEM SUPPLIER AND INSTALLED BY THE ELECTRICAL CONTRACTOR.
② - PROVIDED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.



GENERAL SHEET NOTES:
1. FUTURE IMPROVEMENTS, NOT INCLUDED IN CURRENT PROJECT SCOPE.

MONTANA
KATHLEEN KLACIK
No. 72593 PE
LICENSED PROFESSIONAL ENGINEER
2/12/25

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: Paul Montgomery, P.E.
Approved By: Katie Klacik, P.E.
Checked By: Michael Montoya, P.E.
Designed By: Kathleen Hutchinson

Engineer

Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

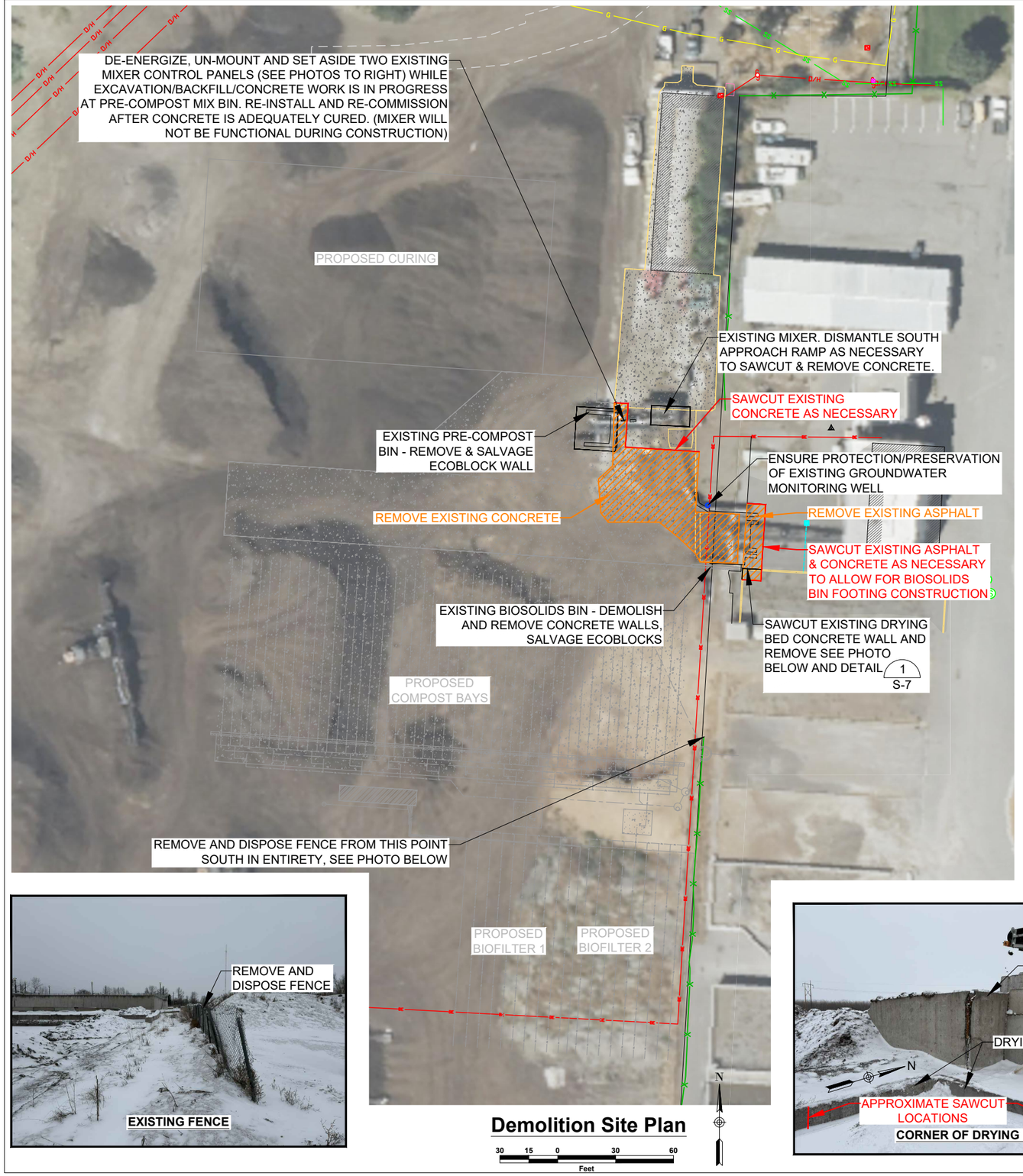
Jacobs
999 Main Street
STE. 1200
Boise, ID 83702
Phone (406) 212-4520

Owner: City Of Missoula

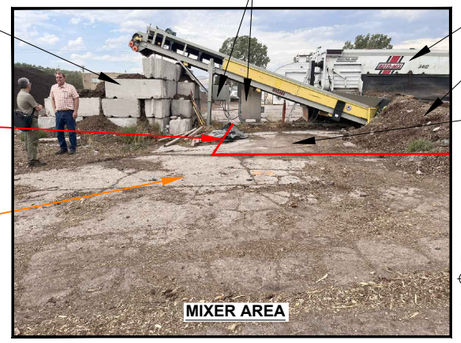
Project Title: Garden City Compost Facility Improvements

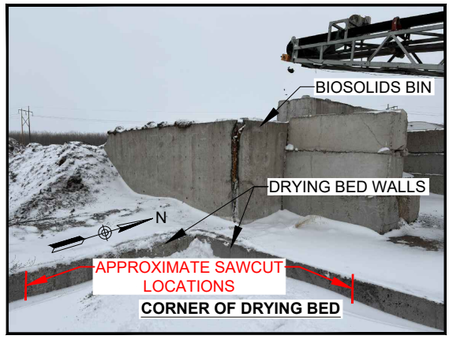
Sheet Title: **Compost Area Network Diagram**

Sheet: **PID-5**



Demolition Site Plan





Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Demolition Site Plan**

Sheet: **D-1**

NOTE:
OVERALL SITE GRADING PLAN SHOWN.
PLEASE SEE SHEETS C-2 & C-3 FOR
DETAILS ON THE GRADING PLAN

Grading Plan

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

Engineer
Anderson~Montgomery
CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

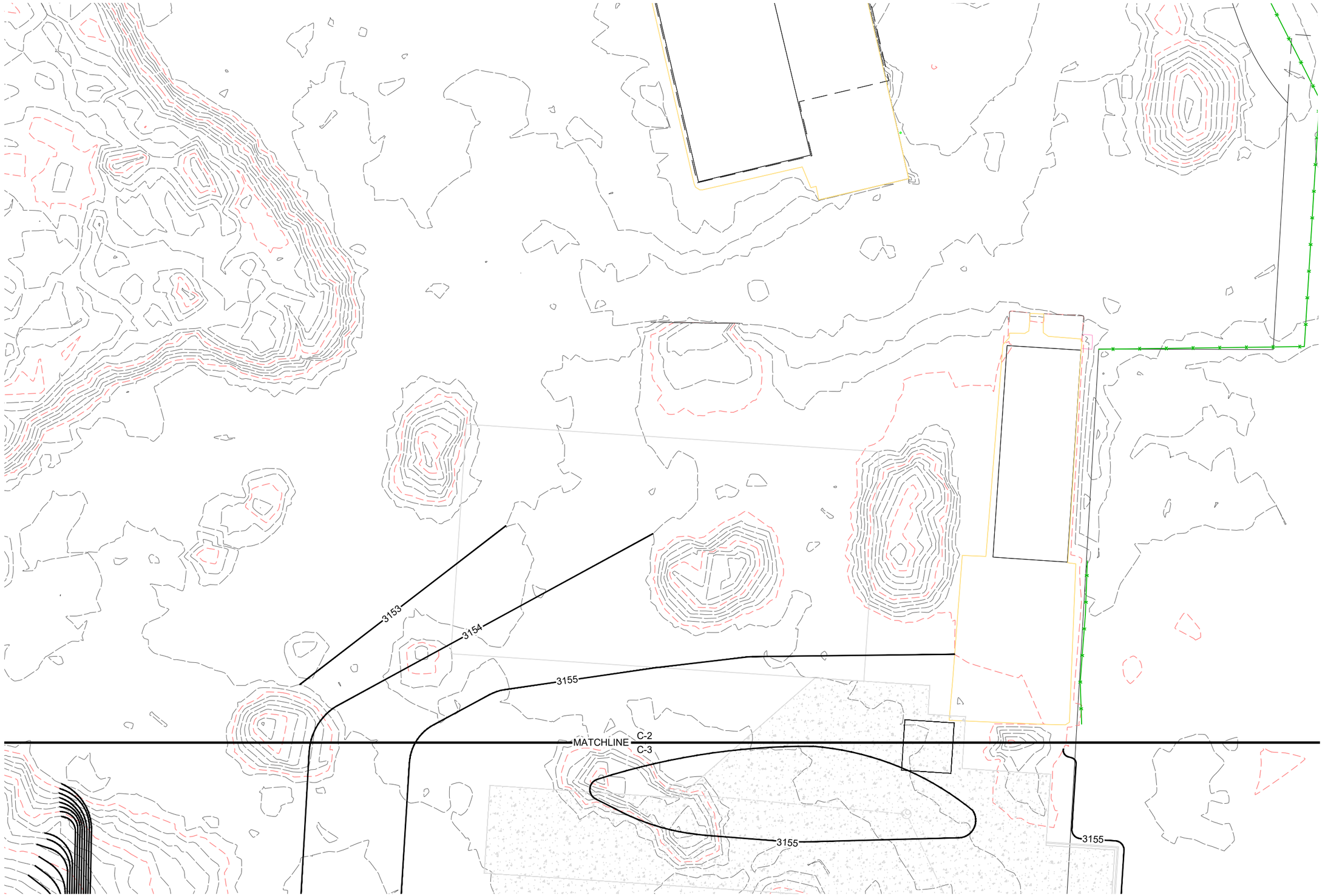
Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Overall Grading Plan**

Sheet: **C-1**

X:\MISSOULA COMPOST\DESIGN\DRAWINGS RE-BID\Sheets\4 - Civil\C-1 Grading Plan.dwg SAVED:5/9/25 PRINTED:5/30/25 BY:ADAM



Grading Plan - North

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

Engineer
Anderson~Montgomery
CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Grading Plan - North**

Sheet: **C-2**

X:\MISSOULA COMPOST\DESIGN\DRAWINGS RE-BID\Sheets\4 - Civil\C-2 & C-3 Grading Plan.dwg SAVED:5/9/25 PRINTED:5/30/25 BY:ADAM

Grading Plan - South

X:\MISSOULA COMPOST\DESIGN\DRAWINGS RE-BID\Sheets\4 - Civil\C-2 & C-3 Grading Plan.dwg SAVED:5/9/25 PRINTED:5/30/25 BY:ADAM

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

Engineer

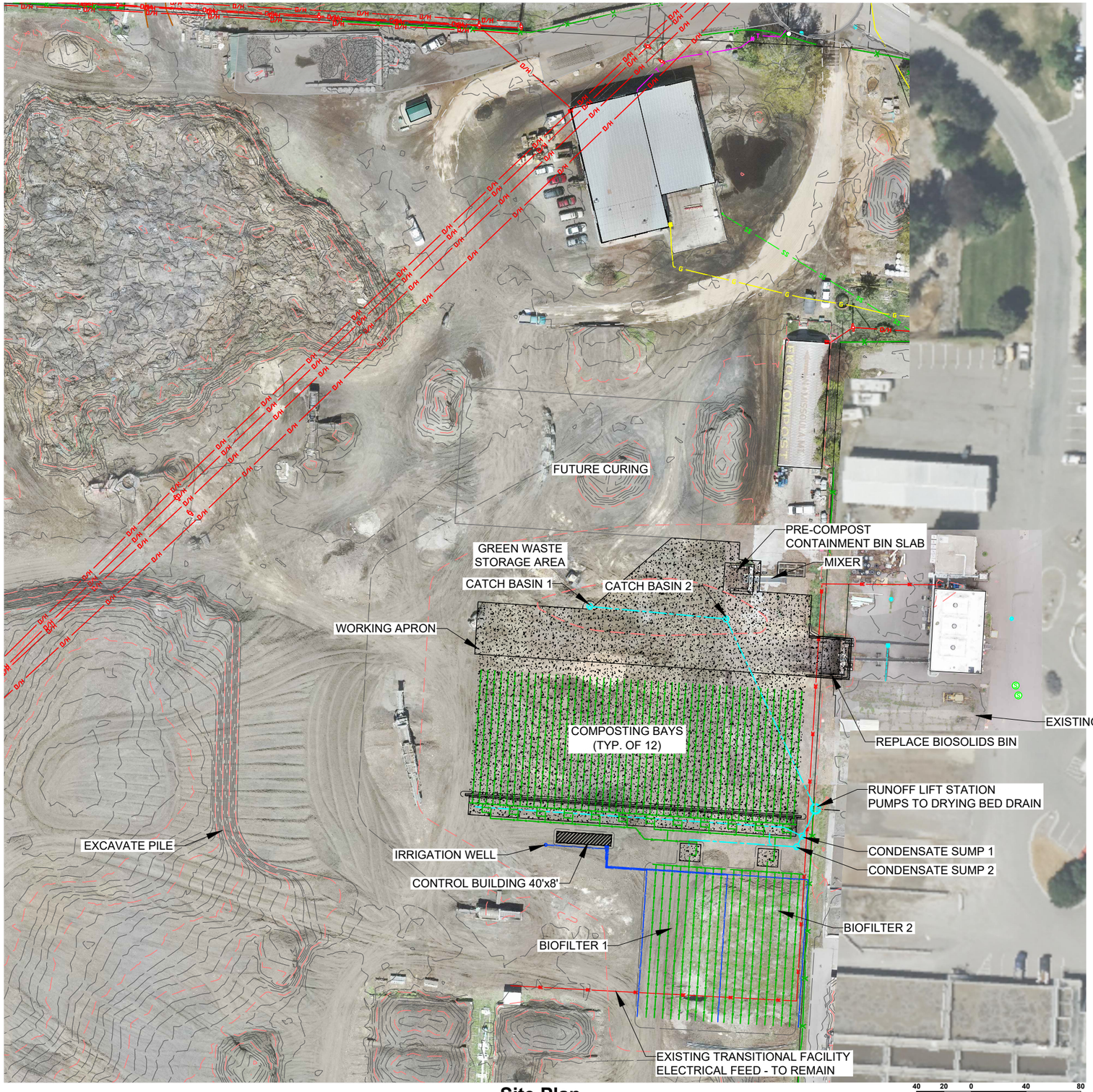
Anderson~Montgomery
CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Grading Plan - South**

Sheet: **C-3**



Site Plan

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

Engineer

Anderson~Montgomery
CONSULTING ENGINEERS

1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Post Bid Revised Site Plan**

Sheet: **C-4**

Compost Bays and Biofilters Site Plan

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Compost Bays and Biofilters Site Plan**

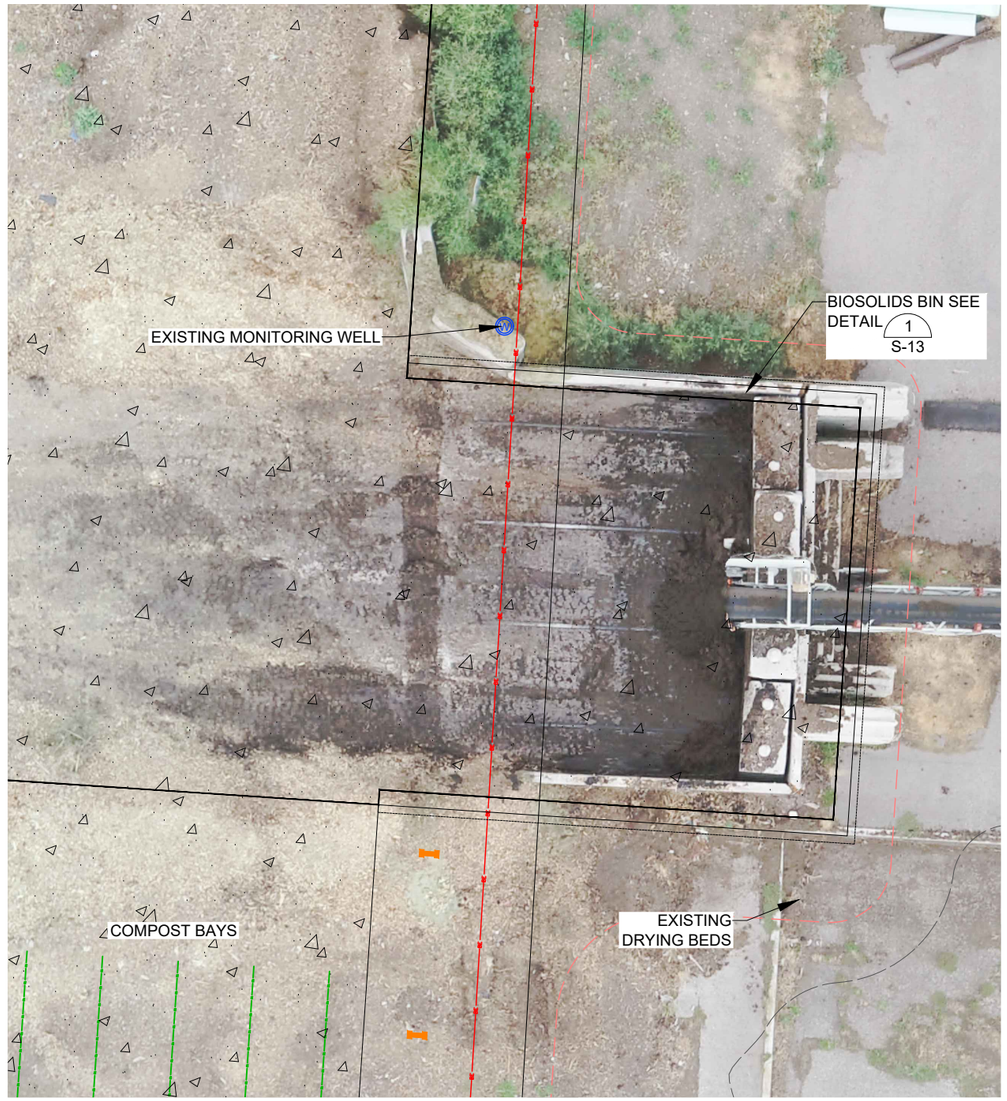
Sheet: **C-7**

X:\MISSOULA COMPOST\DESIGN\DRAWINGS RE-BID\Sheets\4 - Civil\C-7 Compost Bays & Biofilters Site Plan.dwg SAVED:5/9/25 PRINTED:5/30/25 BY:ADAM

Pre-Compost Containment Bin Slab Site Plan

5 2.5 0 5 10 Feet

N



Biosolids Bin Site Plan

5 2.5 0 5 10 Feet

N

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

Engineer
Anderson~Montgomery
CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

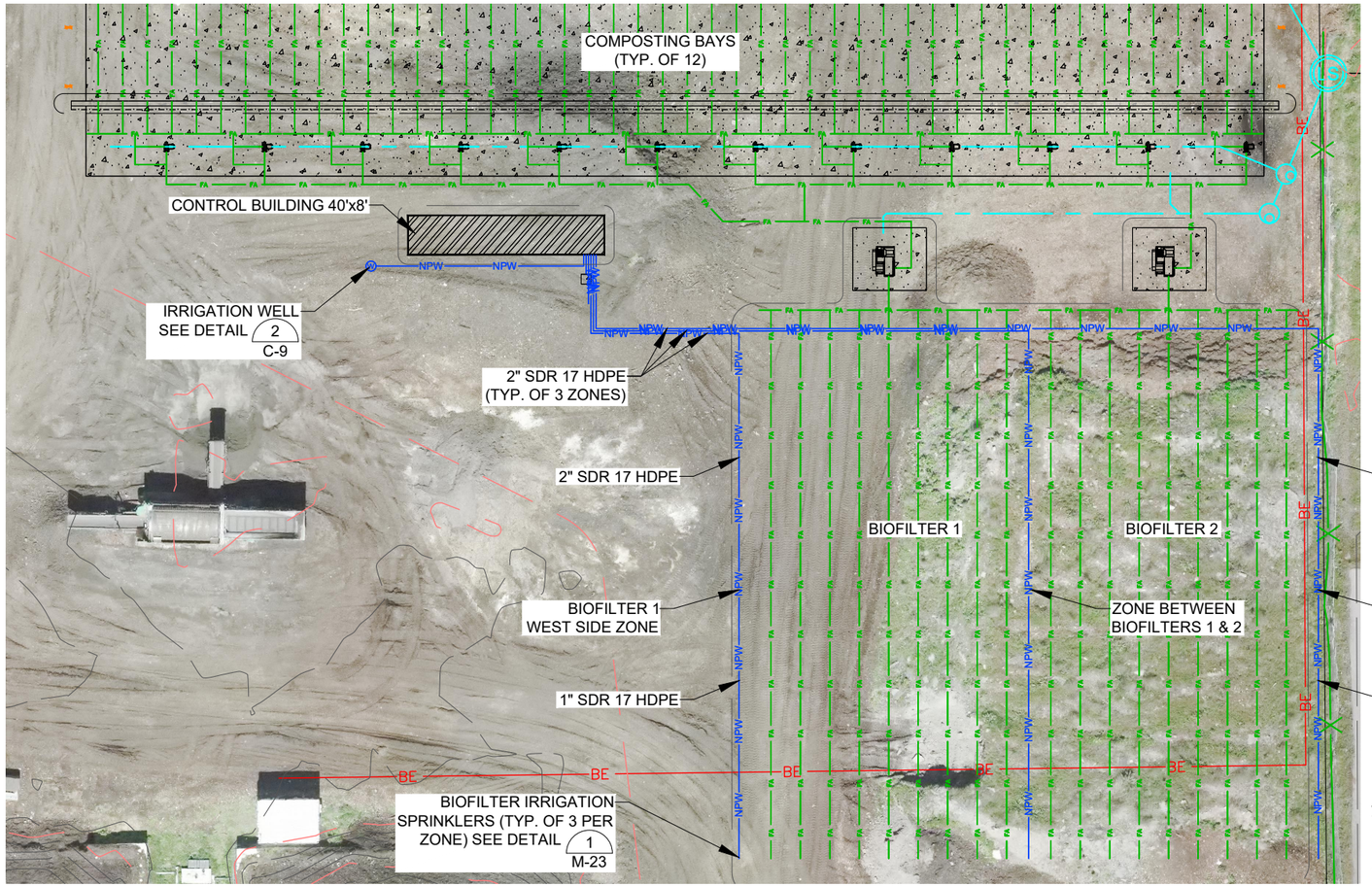
Sheet Title: **Pre-Compost Containment Bin and Biosolids Bin Site Plan**

Sheet: **C-8**

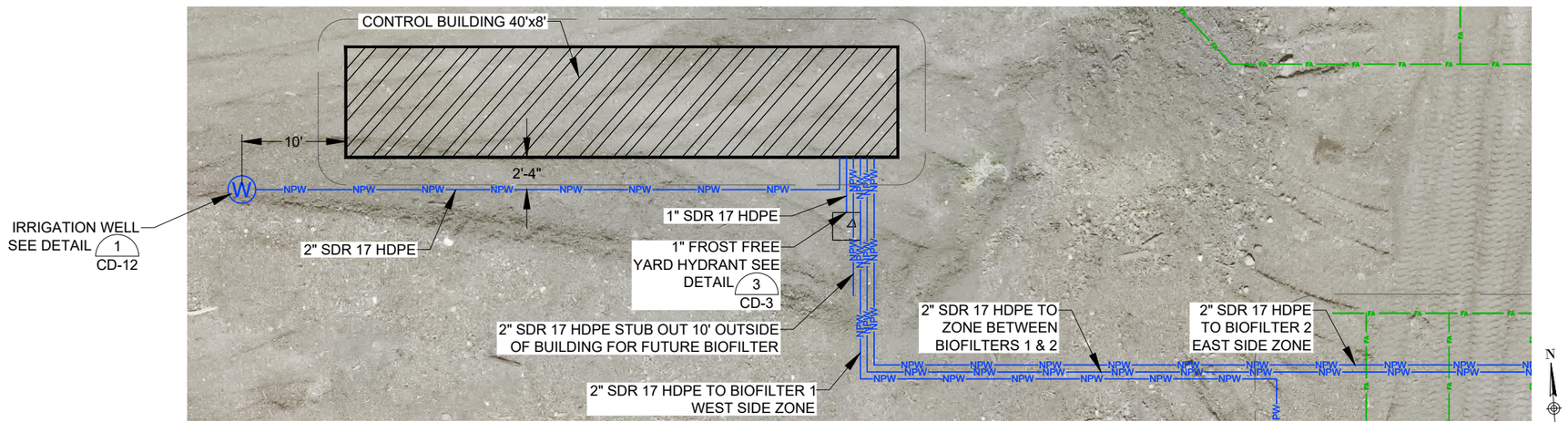
X:\MISSOULA COMPOST\DESIGN\DRAWINGS RE-BID\Sheets\4 - Civil\C-8 Pre-Compost Containment Bin & Biosolids Bin Site Plan.dwg SAVED: 5/30/25 PRINTED: 5/30/25 BY: ADAM

NOTES:

- ALL IRRIGATION PIPING SHALL HAVE A MINIMUM OF 18" OF COVER.
- IRRIGATION PIPING SHALL BE INSTALLED WITH FITTINGS AS SHOWN ON DRAWING OR INSTALLED WITH BENDS NOT EXCEEDING THE BEND RADIUS OF THE PIPE PER THE MANUFACTURER'S RECOMMENDATIONS.
- IRRIGATION SYSTEM MANIFOLD SHALL BE MOUNTED INSIDE THE CONTROL BUILDING ADJACENT TO THE PRESSURE SYSTEM. THE SYSTEM SHALL CONTAIN A KING COUPLER DOWNSTREAM OF THE PRESSURE SYSTEM TO ALLOW THE IRRIGATION SYSTEM TO BE BLOWN OUT, SEE DETAIL 1/CD-13



Irrigation Well Site Plan 1/C-4



Irrigation Well Location 2/C-9

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

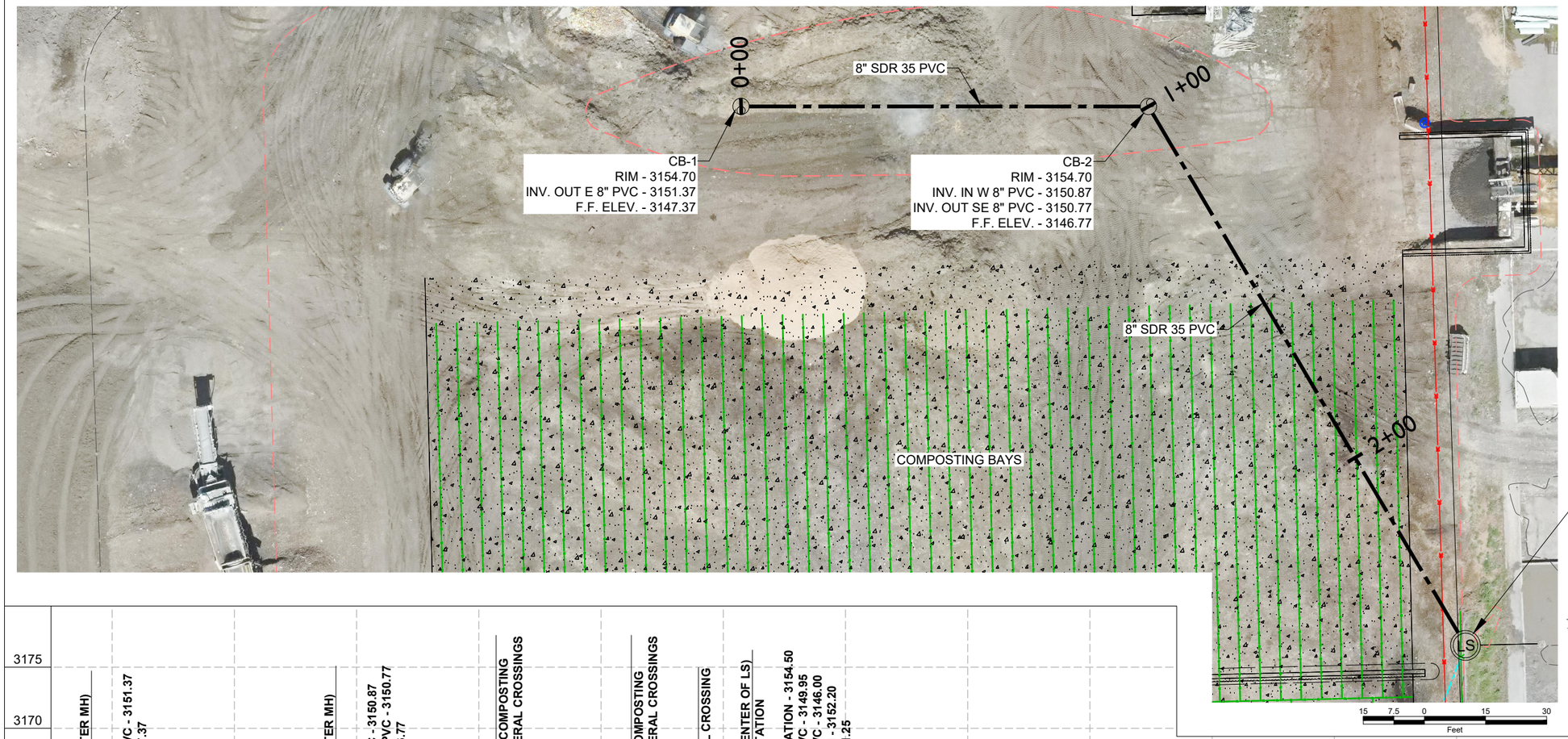
Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Owner: City Of Missoula

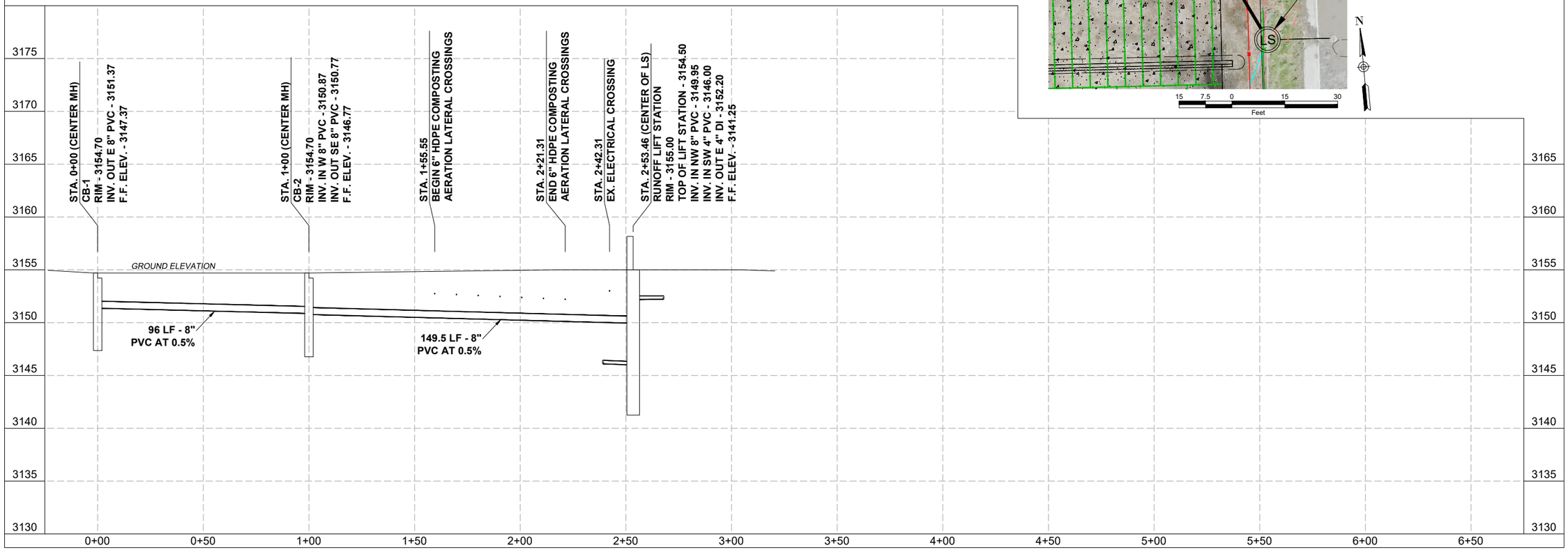
Project Title: Garden City Compost Facility Improvements

Sheet Title: **Irrigation Well Site Plan**

Sheet: **C-9**



NOTE:
ALL UTILITY CROSSING ELEVATIONS ARE APPROXIMATE



Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

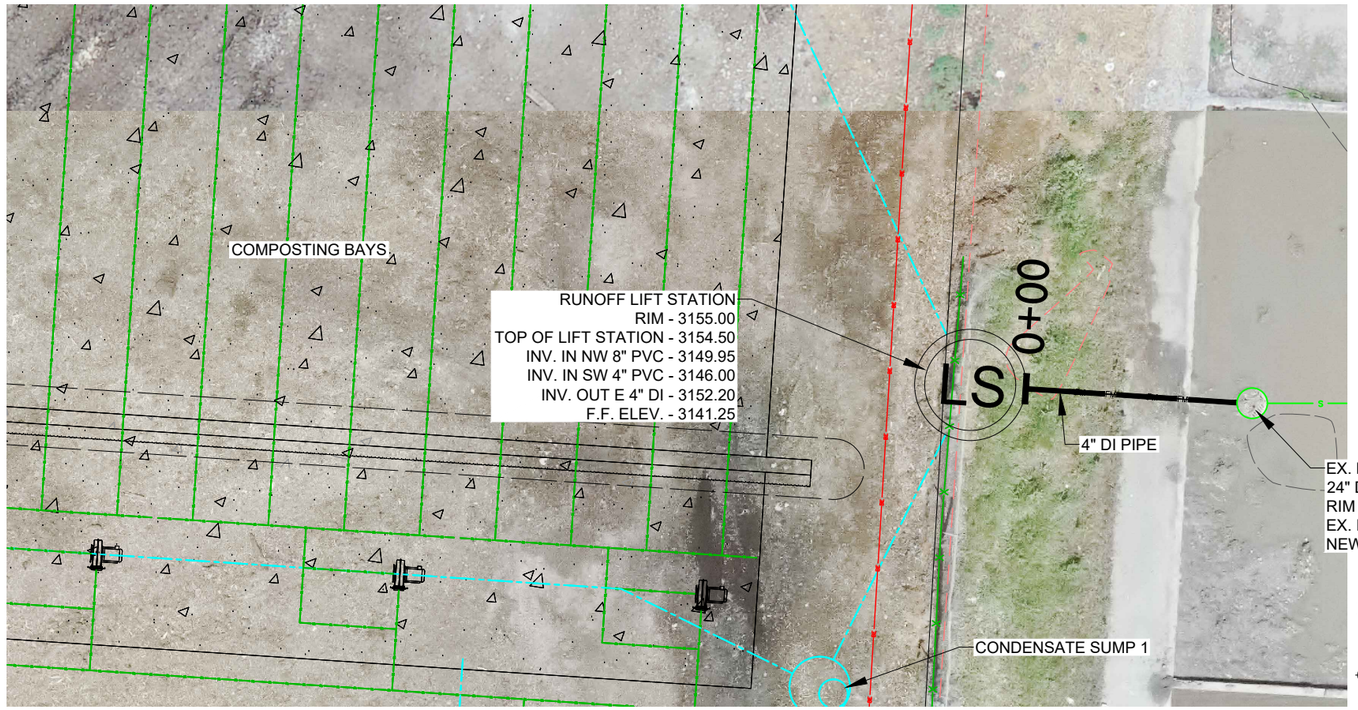
Engineer
Anderson~Montgomery
CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

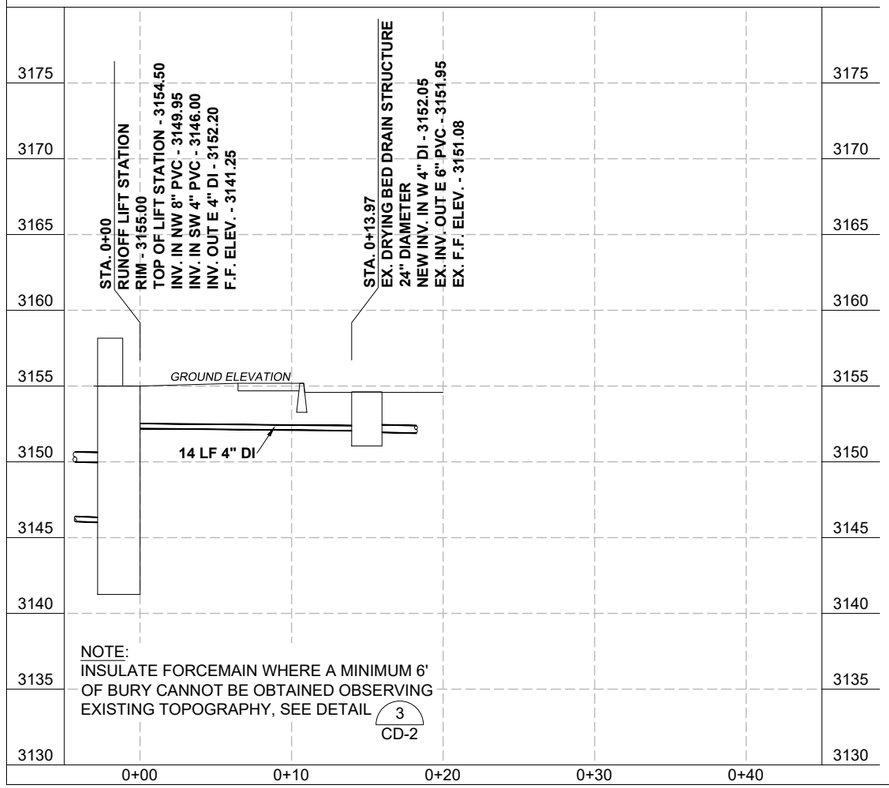
Owner
City Of Missoula

Project Title
Garden City Compost Facility Improvements

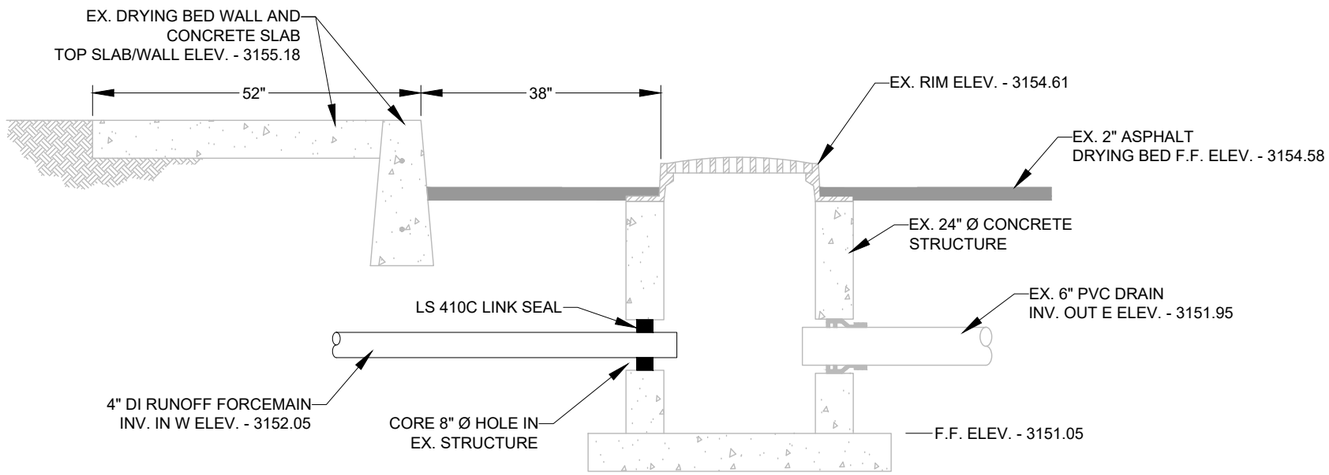
Sheet Title
CB-1 to Lift Station Plan & Profile

Sheet
C-10





NOTE:
INSULATE FORCEMAIN WHERE A MINIMUM 6' OF BURY CANNOT BE OBTAINED OBSERVING EXISTING TOPOGRAPHY, SEE DETAIL 3/CD-2



Ex. Drying Bed Drain Structure Section

1 0.5 0 1 2
Feet

NOTE:
- PIPES AND CONCRETE SLAB/APRON ROTATED FOR DRAWING CLARITY.
- FOR DRYING BED CONCRETE WALL REPAIR SEE DETAIL 2/S-13

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

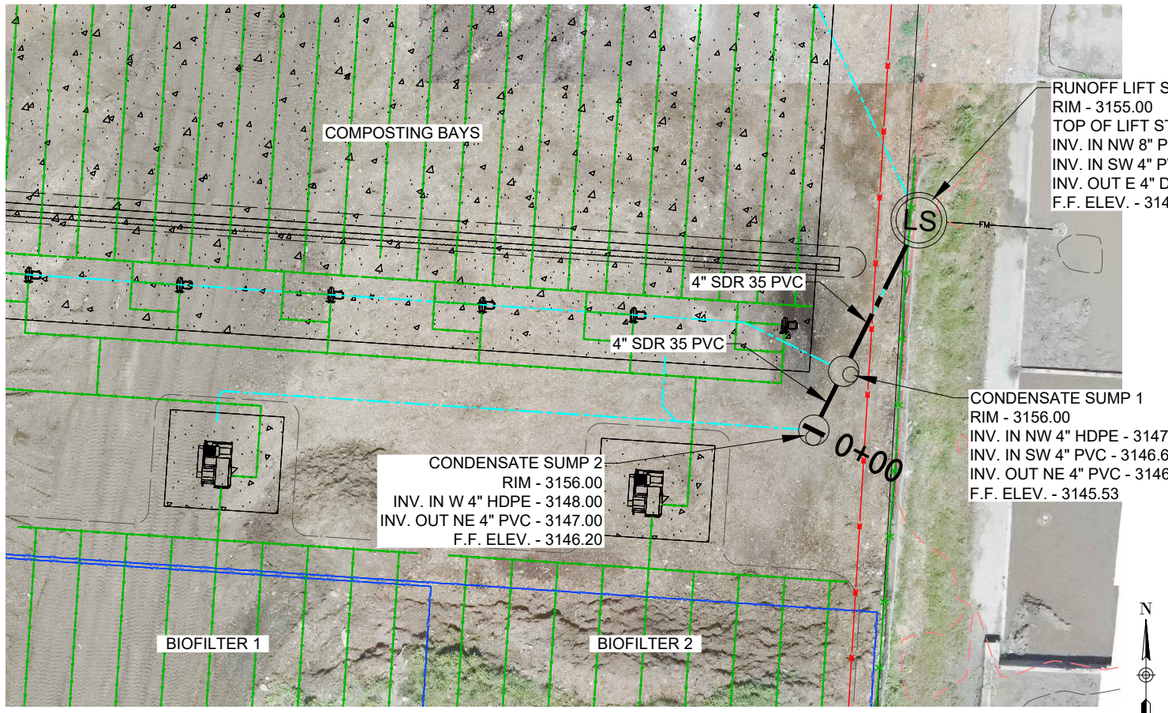
Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Lift Station to Drying Bed Drain Plan & Profile**

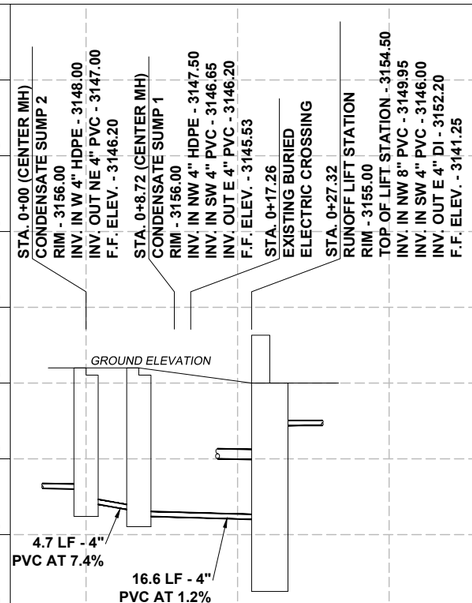
Sheet: **C-11**

NOTE:
ALL UTILITY CROSSING
ELEVATIONS ARE APPROXIMATE



RUNOFF LIFT STATION
RIM - 3155.00
TOP OF LIFT STATION - 3154.50
INV. IN NW 8" PVC - 3149.95
INV. IN SW 4" PVC - 3146.00
INV. OUT E 4" DI - 3152.20
F.F. ELEV. - 3141.25

CONDENSATE SUMP 1
RIM - 3156.00
INV. IN NW 4" HDPE - 3147.50
INV. IN SW 4" PVC - 3146.65
INV. OUT NE 4" PVC - 3146.20
F.F. ELEV. - 3145.53



Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

Engineer
Anderson~Montgomery
CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Sump 2 to Runoff Lift Station Plan & Profile**

Sheet: **C-14**

NOTES:
THE CONTRACTOR SHALL SECURE AUTHORIZATION TO DISCHARGE UNDER MDEQ'S GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY MTR100000 AND PREPARE AN APPROVABLE STORM WATER POLLUTION PREVENTION PLAN (SWPPP). THE SWPPP SHALL IDENTIFY BEST MANAGEMENT PRACTICES (BMPs) TO ADDRESS POTENTIAL RUNOFF, EROSION AND SEDIMENT CONTROL ISSUES AT THE PROJECT SITE. SUGGESTED LOCATIONS AND TYPES OF BMP'S ARE SHOWN IN THE DRAWING, YET ARE NOT MEANT TO BE ALL-INCLUSIVE. CONTRACTOR SHALL BE SOLEYLY RESPONSIBLE FOR SELECTING THE MOST APPROPRIATE BMP, INSTALLATION, PROPER MAINTENANCE AND REMOVAL OF THE BMP UPON PROJECT COMPLETION.

EC - EROSION CONTROL BMP
EC

SC - SEDIMENT CONTROL BMP
SC

RoR - RUN ON/OFF BMP
RoR

OTr - OFFSITE TRACKING
OTr


EXAMPLE SEDIMENT CONTROL BMP


EXAMPLE EROSION CONTROL BMP


EXAMPLE RUN ON/OFF BMP


EXAMPLE OFFSITE TRACKING

Runoff, Erosion and Sediment Control Plan

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Runoff Control Plan**

Sheet: **C-16**

NOTES:
1. KEEP CONCRETE CLEAR OF JOINT AND JOINT ACCESSORIES
2. POUR THRUST BLOCKING AGAINST 3/4" MINUS GRAVEL OR STRUCTURAL FILL. 3/4" MINUS GRAVEL OR STRUCTURAL FILL SHALL BE AGAINST UNDISTURBED EARTH.
3. REQUIRED VOLUMES AND BEARING AREAS SHALL BE AS SHOWN IN THE TABLE AND ADJUSTED, IF NECESSARY, TO CONFORM TO THE TEST PRESSURE(S) AND ALLOWABLE SOIL BEARING STRESS OF 2,000 LBS/SQFT.
4. THRUST BLOCK VOLUMES FOR VERTICAL BENDS HAVING UPWARD RESULTANT THRUSTS ARE BASED ON TEST PRESSURE OF 150 PSIG AND THE WEIGHT OF CONCRETE = 4,050 LBS PER CUBIC YARD. TO COMPUTE VOLUMES FOR DIFFERENT TEST PRESSURES USE THE FOLLOWING EQUATION:
   ACTUAL VOLUME = (TEST PRESSURE/150) X (TABLE VOLUME).
5. BEARING AREAS FOR HORIZONTAL BEND THRUST BLOCKS ARE BASED ON TEST PRESSURE OF 150 PSIG AND AN ALLOWABLE SOIL BEARING STRESS OF 2,000 LBS/SQFT. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURES US THE FOLLOWING EQUATION:
   $B_1 = B(13.33)(P_1 / 2000)$ WHERE:
   P_1 = ACTUAL TEST PRESSURE, PSIG
   B = COMPUTED BEARING AREA
   B = BEARING AREA FROM TABLE
6. VERTICAL BENDS HAVING DOWNWARD RESULTANT THRUSTS AND HORIZONTAL BENDS, HAVE THE SAME THRUST BLOCK REQUIREMENTS.
7. BEARING AREAS, VOLUMES, AND SPECIAL BLOCKING DETAILS SHOWN ELSEWHERE IN THESE PLANS TAKE PRECEDENCE OVER THIS STANDARD DETAIL.
8. THRUST BLOCK BEARING AREA SHALL NOT BE LESS THAN 1.0 SQFT.
9. TEST PRESSURES ARE INDICATED IN THE SPECIFICATIONS AND THE ALLOWABLE SOIL BEARING STRESS IS 2,000 LBS/SQFT.
10. THE USE OF RESTRAINED JOINT SYSTEMS WILL BE ACCEPTED AS AN ALTERNATIVE TO CONVENTIONAL CONCRETE THRUST BLOCKING.
11. **CONTRACTOR SHALL PROVIDE THRUST BLOCKING FOR ALL BURIED FITTINGS AND VALVES.**

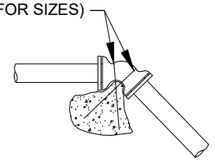
VOLUME OF THRUST BLOCK IN CUBIC YARDS (VERTICAL BENDS)			
FITTING SIZE (INCHES)	BEND ANGLE		
	45°	22-1/2°	11-1/4°
4	0.8	0.3	0.1
6	2.0	0.8	0.3
8	3.0	1.1	0.4
10	4.5	1.7	0.7
12	5.4	2.4	1.0
14	8.6	3.2	1.3
16	11.1	4.2	1.7
18	14.1	5.3	2.2
20	17.3	6.6	2.7
24	24.2	9.2	3.8

BEARING AREA OF THRUST BLOCKS IN SQFT. (HORIZONTAL BENDS)							
FITTING SIZE (INCHES)	TEE, WYE, PLUG, OR CAP	90° BEND, PLUGGED CROSS	TEE, PLUGGED RUN		BEND ANGLE		
			A_1	A_2	45°	22-1/2°	11-1/4°
4	1.3	1.8	1.3	1.8	1.0	1.0	--
6	3.0	4.2	3.0	4.2	2.3	1.2	1.0
8	5.3	7.6	5.3	7.6	4.1	2.1	1.0
10	8.3	11.8	8.3	11.8	6.4	3.3	1.6
12	12.0	17.0	12.0	17.0	9.2	4.7	2.4
14	16.3	23.1	16.3	23.1	12.5	6.4	3.2
16	21.4	30.2	21.4	30.2	16.3	8.3	4.2
18	27.0	32.0	27.0	32.0	20.7	10.5	5.3
20	33.4	47.2	33.4	47.2	25.5	13.0	6.5
24	40.3	55.0	40.3	55.0	35.7	18.0	9.0

NOTE:
* EACH AREA (A/2) IS HAVE OF TABULATED TOTAL AREA
** RESTRAINED PLUG

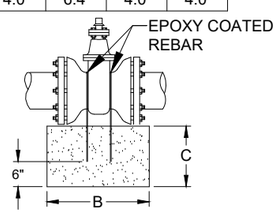
VERTICAL BEND REBAR		
FITTING SIZE	ROD SIZE	EMBEDMENT
12" AND LESS	#6	30"
14" - 16"	#8	36"
18" - 20"	#10	36"
24"	#11	42"

NOTE:
EPOXY COATED REBAR OVER FITTING AND EMBEDDED IN CONCRETE (SEE TABLE FOR SIZES)

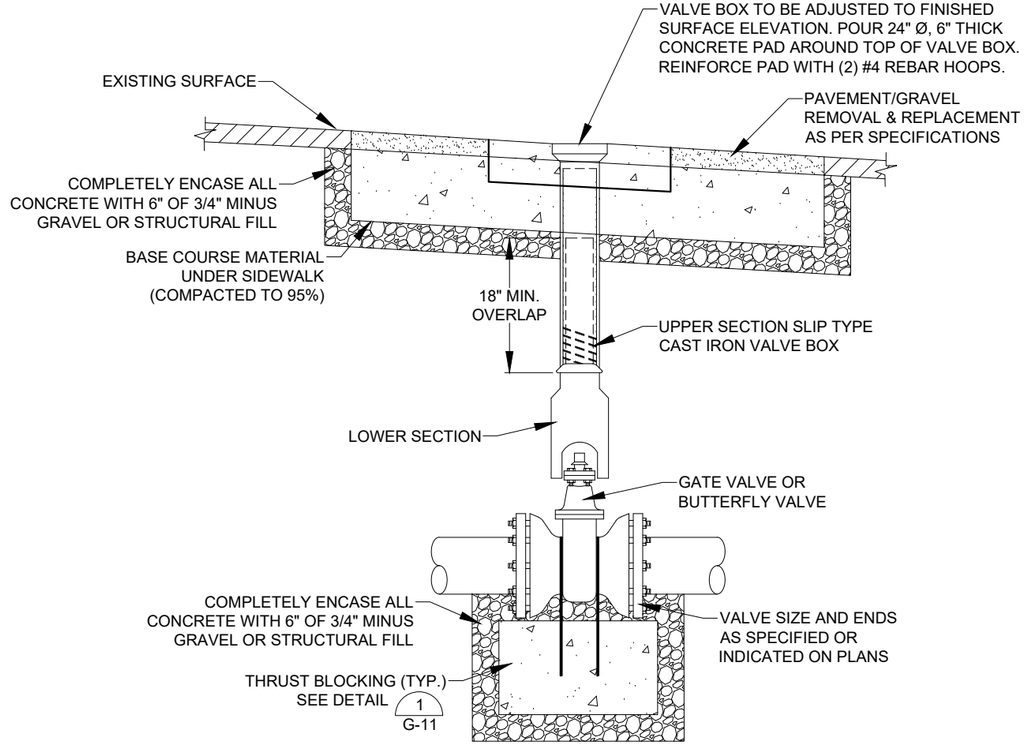


VALVE THRUST BLOCK DIMENSIONS							
VALVE SIZE	REBAR SIZE	100 PSI			150 PSI		
		A	B	C	A	B	C
4"	#6	2.0'	2.0'	2.0'	2.0'	2.0'	2.0'
6"	#6	2.0'	2.0'	2.0'	2.0'	2.0'	2.0'
8"	#6	2.0'	2.0'	2.0'	2.0'	2.0'	2.0'
10"	#6	2.0'	2.0'	2.0'	2.5'	2.5'	2.0'
12"	#6	2.3'	2.0'	2.0'	3.0'	3.0'	2.7'
14"	#8	2.3'	2.0'	2.3'	3.4'	3.0'	3.0'
16"	#9	3.0'	3.0'	2.9'	4.3'	3.0'	3.0'
18"	#10	3.7'	3.0'	3.0'	5.4'	3.0'	3.0'
20"	#10	3.9'	3.3'	3.3'	5.7'	3.3'	3.3'
24"	#11	4.3'	4.0'	4.0'	6.4'	4.0'	4.0'

NOTE:
DIMENSION 'A' IS WIDTH OF THRUST BLOCK (PERPENDICULAR TO PAGE)

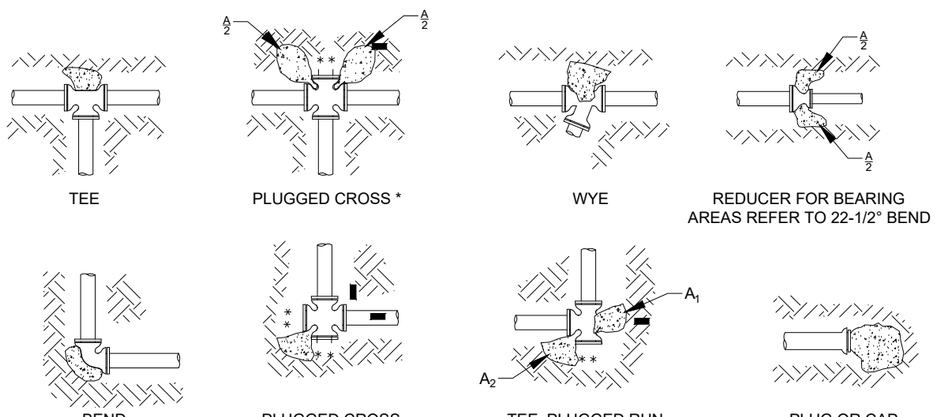


Thrust Block 1
NO SCALE



NOTE:
1. ALL VALVES AND FITTINGS SHALL BE POLYWRAPPED AND SEALED WITH 3M POLYTAPE OR APPROVED EQUAL.
2. NO PAYMENT SHALL BE MADE FOR ADJUSTMENT OF VALVE BOXES TO FINAL GRADE.
3. COMPACT ALL BACKFILL AROUND THE VALVE BOX UPPER SECTION BY MEANS OF HAND TAMPING.
4. CONTRACTOR SHALL PROVIDE OWNER WITH 1 VALVE WRENCH.
5. ALL CONCRETE AND CONCRETE THRUST BLOCKING SHALL BE ENCASED IN 3/4" MINUS GRAVEL OR STRUCTURAL FILL.

Valve Setting 2
NO SCALE



Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

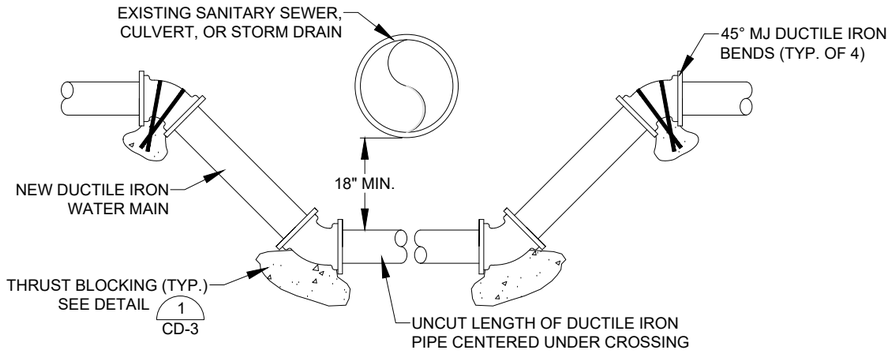
Owner
City Of Missoula

Project Title
Garden City Compost Facility Improvements

Sheet Title
Civil Details

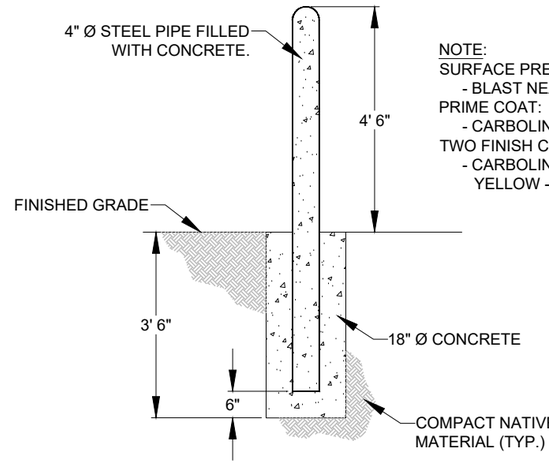
Sheet
CD-1

X:\MISSOULA COMPOST\DESIGN\DRAWINGS RE-BID\Sheets\5 - Civil Details\CD-1 Civil Details.dwg SAVED: 4/24/25 PRINTED: 5/7/25 BY: ADAM



NOTE:
DURING CROSSINGS, STRUCTURAL SUPPORT OF THE SEWER OR STORM DRAIN SHALL BE PROVIDED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREVENTING DAMAGE TO ANY EXISTING PIPES. IF AN EXISTING PIPE IS DAMAGED DUE TO CONTRACTOR NEGLIGENCE, THE PIPE SHALL BE REPAIRED AT NO ADDITIONAL COST TO THE OWNER.

Vertical Pipe Adjustment 1
NO SCALE



NOTE:
SURFACE PREPARATION:
- BLAST NEAR-WHITE
PRIME COAT:
- CARBOLINE CARBOCOAT 150-3.0 MIL DFT.
TWO FINISH COATS:
- CARBOLINE CARBOCOAT 30 OSHA YELLOW - 3.0 MIL DFT TOTAL

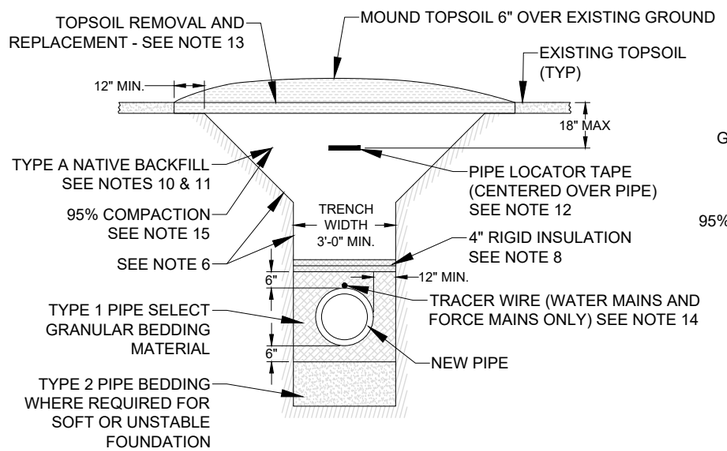
NOTE:
- BUILDING FACE, CONCRETE PADS, OR OTHER DRIVING HAZARDS SHALL BE A MINIMUM OF 12" FROM THE CENTERLINE OF PIPE BOLLARD.

Typical Pipe Bollard Detail 2
NO SCALE

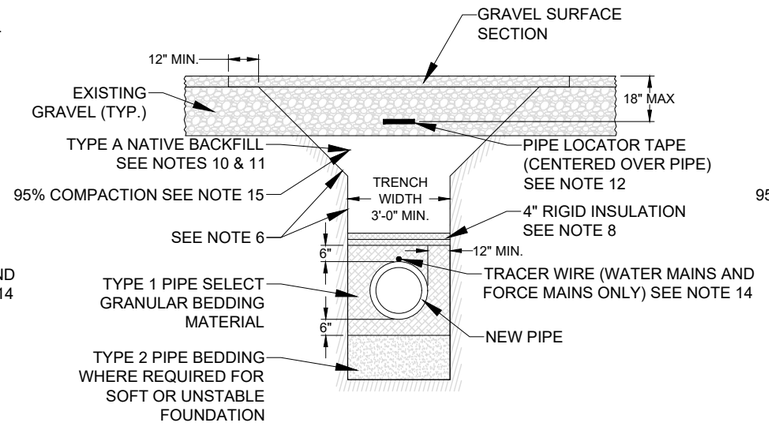
NOTES:
1. WHERE TRENCH PASSES THROUGH UNIMPROVED SURFACES: THE TOPSOIL SHALL BE REMOVED AND REPLACED A MINIMUM OF 12" FROM THE EDGE OF THE TRENCH OPENING.
2. WHERE TRENCH PASSES THROUGH EXISTING GRAVEL: THE GRAVEL SHALL BE REMOVED AND REPLACED A MINIMUM OF 12" FROM THE EDGE OF THE TRENCH OPENING.
3. WHERE TRENCH PASSES THROUGH EXISTING PAVEMENT: THE PAVEMENT SHALL BE CUT ALONG A NEAT VERTICAL LINE A MINIMUM OF 12" FROM THE EDGE OF THE TRENCH OPENING, JUST PRIOR TO PAVING.
4. WHERE TRENCH PASSES THROUGH EXISTING PAVEMENT: SAWCUT THE ASPHALT ALONG A NEAT VERTICAL LINE PER LIMITS SHOWN ON THE PLANS, JUST PRIOR TO PAVING. WHERE IMPORTED TRENCH BACKFILL IS NOT USED, SEPARATION/STABILIZATION FABRIC, PROPEX GEOTEX 801 NON-WOVEN GEOTEXTILE FABRIC OR APPROVED EQUAL WILL BE USED.
5. VERIFY THAT COMPACTION METHODS ARE COMPARABLE WITH PIPE MANUFACTURER'S RECOMMENDATIONS. ANY DAMAGE TO THE PIPE WILL BE THE CONTRACTOR'S RESPONSIBILITY.

NOTES CONTINUED:
6. TRENCH SHALL BE CONSTRUCTED TO OSHA SPECIFICATIONS FOR EXCAVATION. DRAWINGS DO NOT SHOW TRENCH DIMENSIONS OR BACK-SLOPES THAT MAY BE REQUIRED. CONTRACTOR REQUIRED TO DETERMINE WHICH OSHA SPECIFICATIONS ARE APPLICABLE.
7. ALL SPOILS SHALL BE REMOVED AND DISPOSED OF AT AN APPROVED LOCATION.
8. INSTALL 4" OF RIGID INSULATION THE FULL WIDTH OF THE TRENCH IN AREAS SHOWN ON PLANS.
9. ALL ROCKS GREATER THAN 12" IN ANY DIMENSION SHALL BE HAULED OFF SITE AND DISPOSED OF PROPERLY.
10. NO ROCKS OR LUMPS LARGER THAN 2" IN ANY DIMENSION SHALL BE ALLOWED WITHIN 6" OF THE PIPE.
11. USE SUITABLE NATIVE MATERIAL FOR BACKFILL. SEE TECHNICAL SPECIFICATIONS FOR CONDITIONS REQUIRING IMPORTED TRENCH BACKFILL.

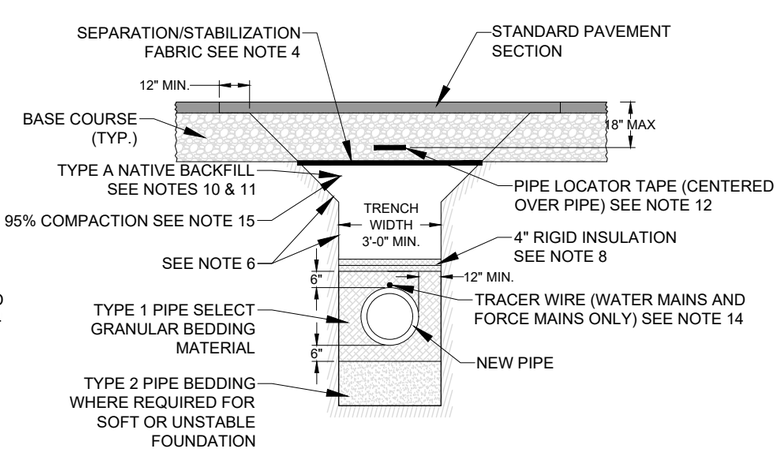
NOTES CONTINUED:
12. USE LABELED AND COLOR-CODED TAPE FOR THE APPROPRIATE UTILITY PIPE, PLACED 18" MAXIMUM BELOW FINISHED SURFACE.
13. SEED, FERTILIZE, AND MULCH ALL DISTURBED AREAS WHICH ARE NOT PAVED, CONCRETED, SODDED, OR GRAVELED PER SPECIFICATIONS.
14. FOR WATER MAINS AND FORCE MAINS TRACER WIRE SHALL BE TAPED TO TOP OF ALL PLASTIC PIPE (PVC, POLYTHYLENE, AND HDPE) AND BROUGHT UP FIRE HYDRANTS AND VALVE PIPE CASINGS.
15. COMPACTION REFERS TO PERCENT OF MAXIMUM DENSITY DETERMINED BY A STANDARD PROCTOR. ASTM D698-91. TRENCHES EXCEEDING 10 FEET IN DEPTH SHALL BE COMPACTED TO 98% OF MAXIMUM DENSITY PER ASTM D698-91.
16. FINISHED GRADE MUST MATCH THE ORIGINAL EXISTING GRADE WHERE PIPE IS INSTALLED UNLESS OTHERWISE NOTED.
17. REFER TO GENERAL NOTES FOR ADDITIONAL REQUIREMENTS.



UNIMPROVED SURFACE



GRAVELED SURFACE



PAVED SURFACE

Pipe Bedding & Backfill Details 3
NO SCALE

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

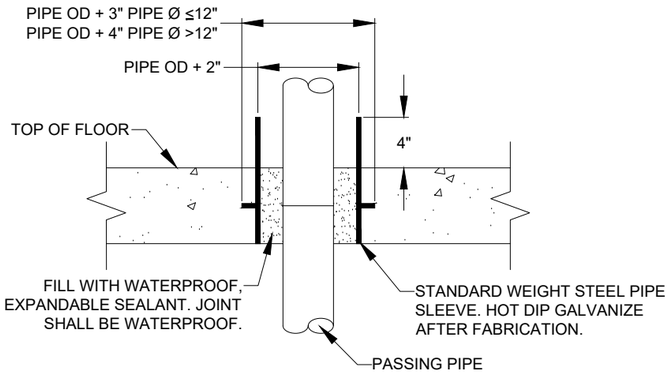
Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

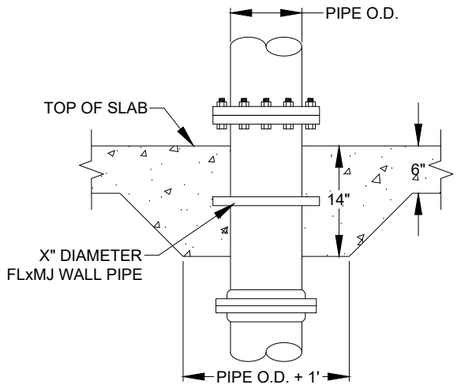
Sheet Title: **Civil Details**

Sheet: **CD-2**



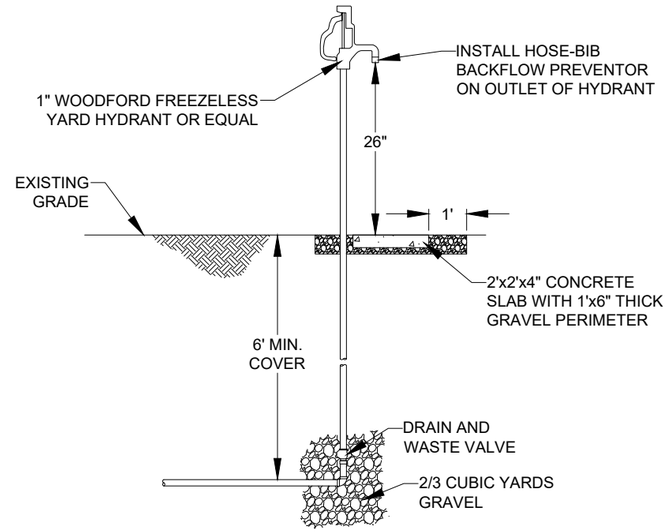
Typical Floor Sleeve Detail 1
NO SCALE

NOTES:
- COAT FLOOR SLEEVE WITH SPECIFIED PAINT SYSTEM BEFORE CONCRETE PLACEMENT.
- PROVIDE WATERPROOF FIRESTOPPING FOR FIRE RATED FLOOR CONDITION.



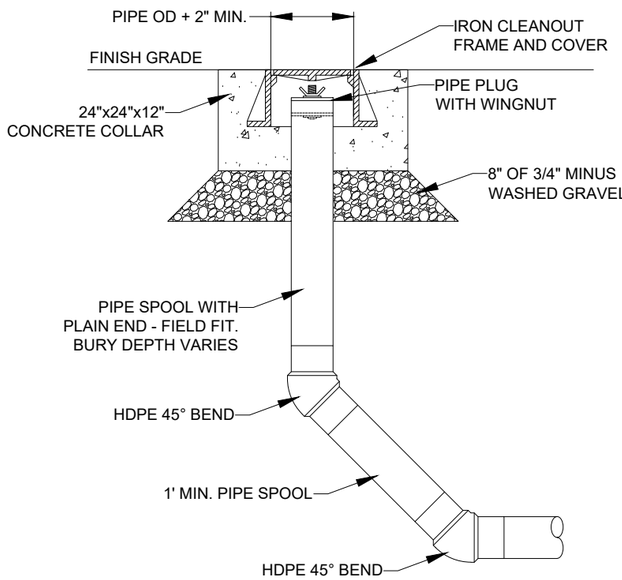
NOTE: INSTALL WALL PIPE FOR FLOOR PENETRATIONS AS PER MANUFACTURERS RECOMMENDATIONS REGARDING LAY LENGTH AND AND FL/MJ CLEARANCE FROM TOP/BOTTOM OF SLAB.

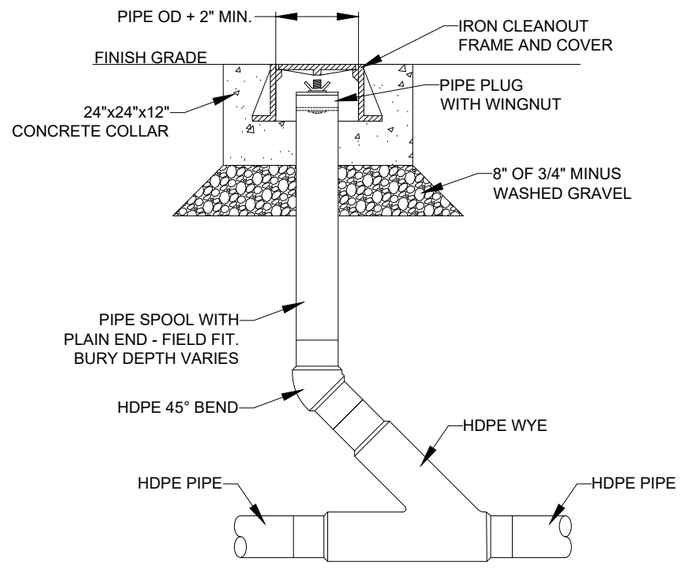
Typical Floor Penetration Detail 2
NO SCALE



Typical Yard Hydrant Assembly Detail 3
NO SCALE

C-9





NOTE:
DEPENDING ON PIPING THE CLEANOUT IS CONNECTING TO THERE SHALL EITHER BE TWO 45° BENDS OR ONE 45° BEND AND ONE WYE.

Exterior Cleanouts 4
NO SCALE

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

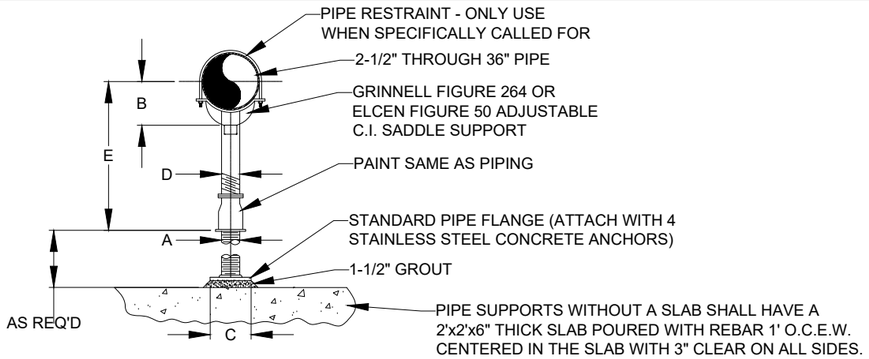
Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Civil Details**

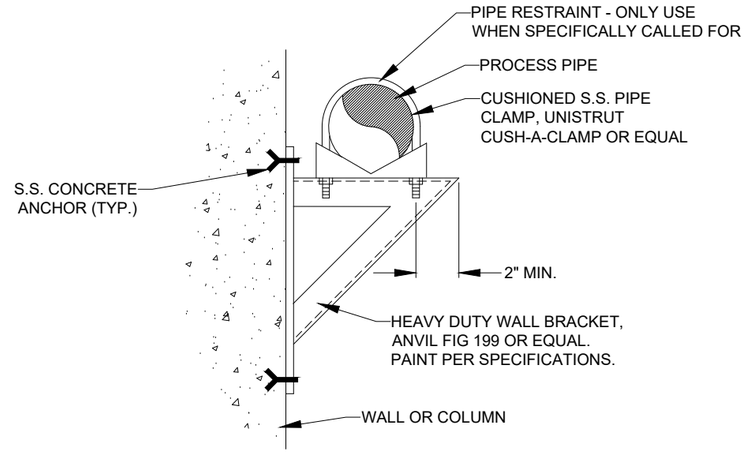
Sheet: **CD-3**



NOTES:
- PROVIDE NEOPRENE WAFFLE ISOLATION PAD. SIMILAR TO MASON TYPE "W" OR KORFUND KORPAD40. UNDER SUPPORT FOOT WHEN PIPING IS ISOLATED OR SUPPORT IS ADJACENT TO MECHANICAL EQUIPMENT.
- FOR BASE HEIGHT AND FLANGE DIMENSIONS, SEE TABLE BELOW.

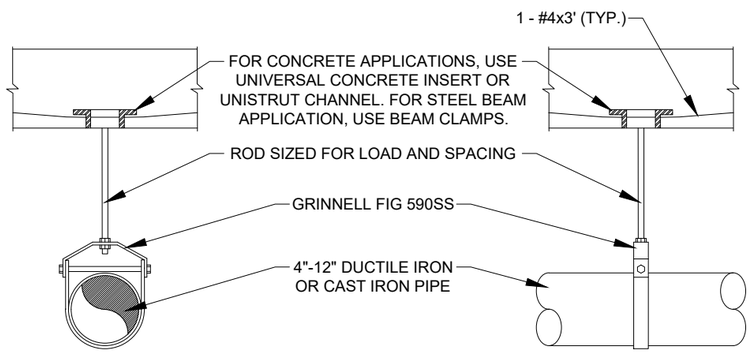
DIMENSION TABLE						
PIPE SIZE	A	B	C	D	E	
					MIN	MAX
2-1/2"	2-1/2"	3-1/2"	9"	1-1/2"	8"	13"
3"	2-1/2"	3-3/4"	9"	1-1/2"	8-1/4"	13-1/4"
3-1/2"	2-1/2"	4"	9"	1-1/2"	8-1/2"	13-1/2"
4"	3"	4-1/4"	9"	2-1/2"	9-1/4"	14"
5"	3"	4-7/8"	9"	2-1/2"	10"	14-3/4"
6"	3"	5-1/2"	9"	2-1/2"	10-1/2"	15-1/4"
8"	3"	6-7/8"	9"	2-1/2"	11-3/4"	16-1/2"
10"	3"	8-1/2"	9"	2-1/2"	13-1/2"	18-1/4"
12"	3"	9-15/16"	9"	2-1/2"	15"	19-3/4"
14"	4"	10-15/16"	11"	3"	16-1/4"	20-3/4"
16"	4"	12-3/8"	11"	3"	17-3/4"	22-1/4"

Pipe Support Detail (1)
NO SCALE



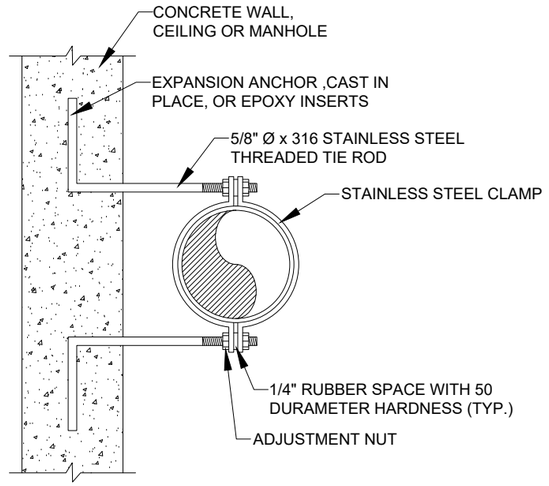
NOTE:
PROVIDE S.S. COMPONENTS FOR SUBMERGED APPLICATIONS OR WHEN SUPPORT IS INSIDE A BURIED STRUCTURE.

Heavy Duty Pipe Support (2)
NO SCALE



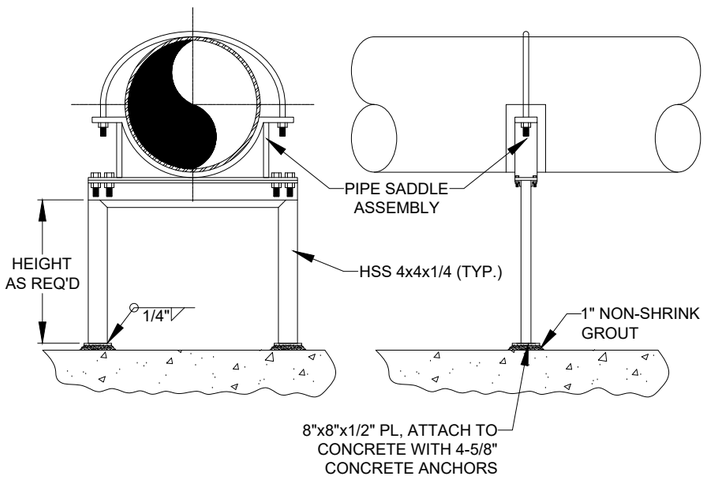
NOTE:
- TOTAL LOADING ON EACH CONCRETE INSERT OR OTHER TYPE HANGER ROD ANCHOR SHALL NOT EXCEED MANUFACTURER'S RECOMMENDED LOADING.
- FOR INSULATED PIPES, USE GRINNELL FIGURE 167 (INSULATION PROTECTION SHIELD).
- FOR STEEL PIPE USE GRINNELL FIGURE 260.

Typical Pipe Hanger (3)
NO SCALE



NOTES:
CLAMP, BOLTS AND NUTS TO BE STAINLESS STEEL AND SIZED AS REQUIRED.

Vertical Pipe Support (4)
NO SCALE



Biofilter Header Pipe Support (5)
NO SCALE

NOTE:
ALL BIOFILTER PIPE SUPPORTS SHALL HAVE A 2'x2'x6" THICK SLAB POURED WITH REBAR 1' O.C.E.W. CENTERED IN THE SLAB WITH 3" CLEAR ON ALL SIDES.

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

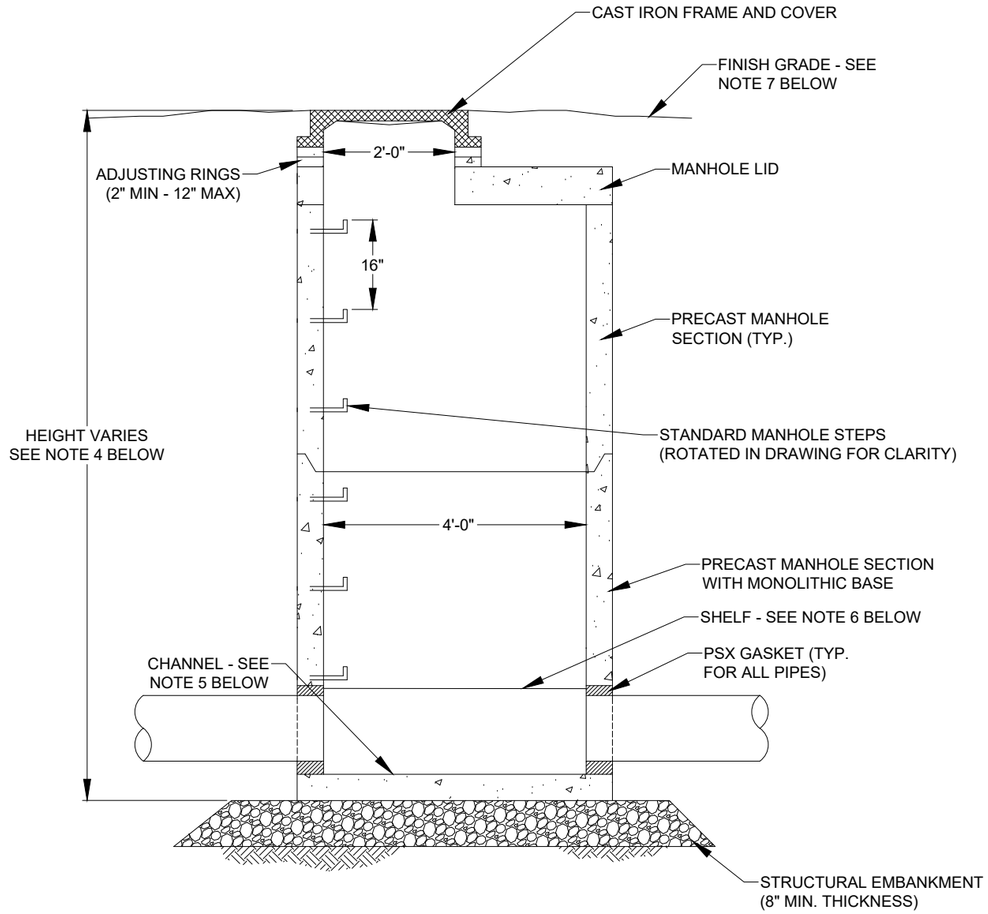
Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Pipe Supports**

Sheet: **CD-4**

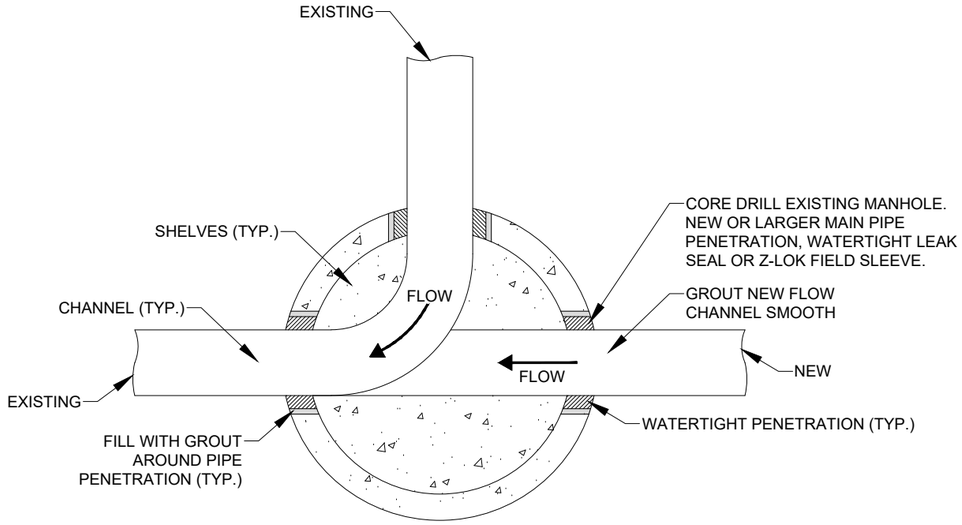


NOTES:

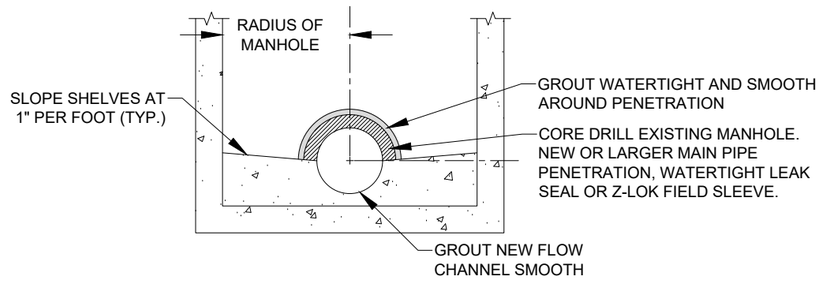
1. PRECAST CONCRETE MANHOLES SHALL CONFORM TO ASTM C478.
2. ALL JOINTS SHALL BE WATERTIGHT. MATERIAL SHALL BE RUBBER-NEK OR APPROVED EQUAL.
3. MANHOLE COVER SHALL BE UNMARKED.
4. SEE PLAN AND PROFILE SHEETS FOR MANHOLE DIMENSIONS. ECCENTRIC MANHOLE SECTIONS WILL NOT BE ALLOWED. PROVIDE RISER SECTION AND COVER SLAB.
5. CHANNEL SHALL BE HALF THE DIAMETER OF THE PIPE.
6. CONCRETE SHELVES SHALL SLOPE TOWARD THE CHANNEL(S) AT 1" PER FOOT.
7. PROVIDE FILL MATERIAL, SLOPED AT 2 HORIZONTAL TO 1 VERTICAL FOR COVERS SET ABOVE EXISTING GROUND LEVEL.
8. CONSTRUCT SHELVES PER LATEST EDITION OF MPW.
9. PROVIDE 3" GROUT SPACE AROUND ALL PIPE. ALL JOINTS SHALL BE GROUTED WATERTIGHT. CONFORM TO MANHOLE LINER MANUFACTURER'S RECOMMENDATIONS.
10. NEW MANHOLES SHALL BE COATED WITH AN EXTERIOR DAMPPROOFING; BITUMINOUS COAT OR COAL TAR EPOXY.
11. FINISHED MANHOLES SHALL BE IN ACCORDANCE WITH LATEST EDITION OF MPWSS STANDARD SPECIFICATIONS.
12. STEPS SHALL BE PLACED AT 90° TO THE LINE OF SEWER PIPE WHERE APPLICABLE. STEPS ARE ROTATED IN DRAWING FOR CLARITY.
13. PROVIDE ALL SHORING NECESSARY TO PROTECT EXISTING STRUCTURES AND INFRASTRUCTURE.
14. MANHOLES SHALL EITHER UTILIZE A BARREL SECTION & A FLAT LID OR A CONICAL SECTION, SEE DRAWINGS FOR SPECIFIC MANHOLE DETAILS.

Standard Sanitary Sewer Manhole (1)

NO SCALE



CONFIGURATION MAY VARY



CHANNEL SECTION

NOTES:

- SLOPE ALL SHELVES TO CHANNEL AT 1" PER FOOT.
- ALL NEW HOLES SHALL BE CORED AND LARGE ENOUGH FOR WATERTIGHT SEAL. GROUT SEAL IN PLACE WITH NON-SHRINK GROUT.
- ROTATE CONE AND STAIRS SUCH THAT STAIRS ARE NOT ABOVE CHANNELS.
- RECONSTRUCT FLOW CHANNEL IN ACCORDANCE WITH MPWSS STANDARD DRAWING NO. 02720-7.
- MANHOLE CONFIGURATIONS MAY VARY FROM DETAIL DEPICTED ABOVE.

Modify Existing Manhole (2)

NO SCALE

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

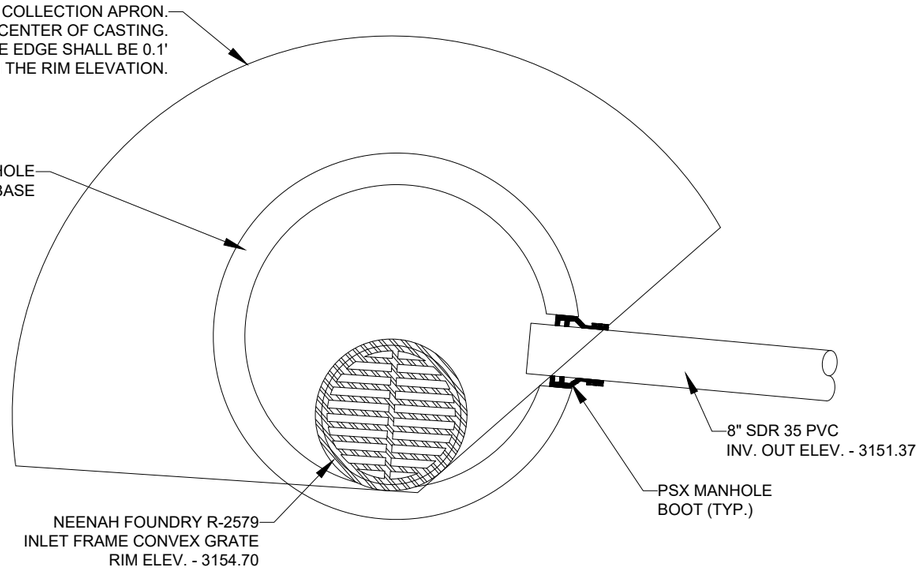
Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Manhole Details**

Sheet: **CD-5**

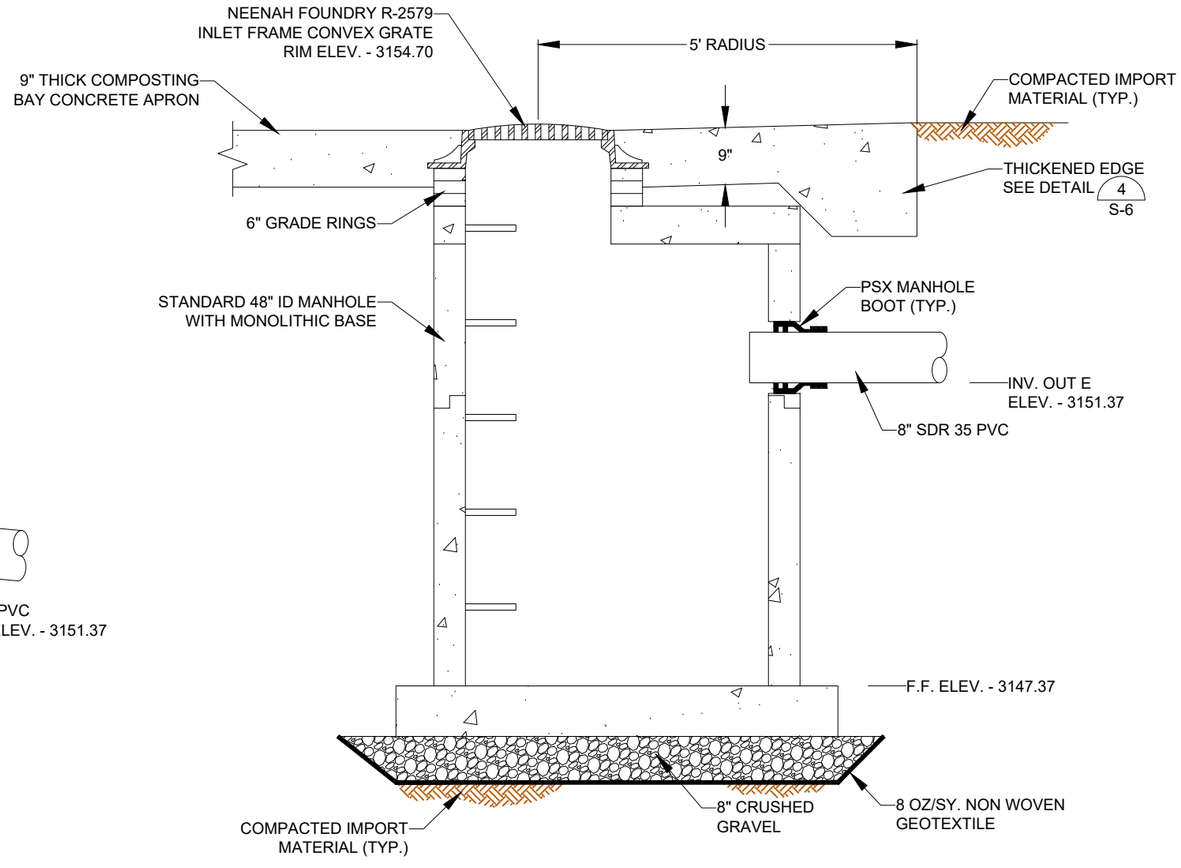


Catch Basin 1 Plan (1)

1 0.5 0 1 2
Feet

N

NOTE:
- CONCRETE HATCHING NOT SHOWN FOR DRAWING CLARITY.



Catch Basin 1 Section

1 0.5 0 1 2
Feet

NOTE:
- PIPES AND CONCRETE SLAB/APRON ROTATED FOR DRAWING CLARITY.

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

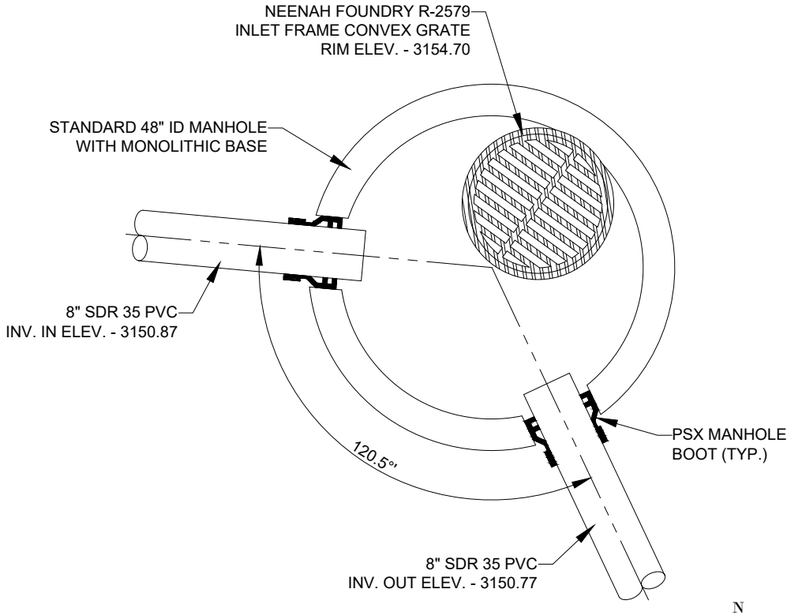
Engineer
Anderson~Montgomery
CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

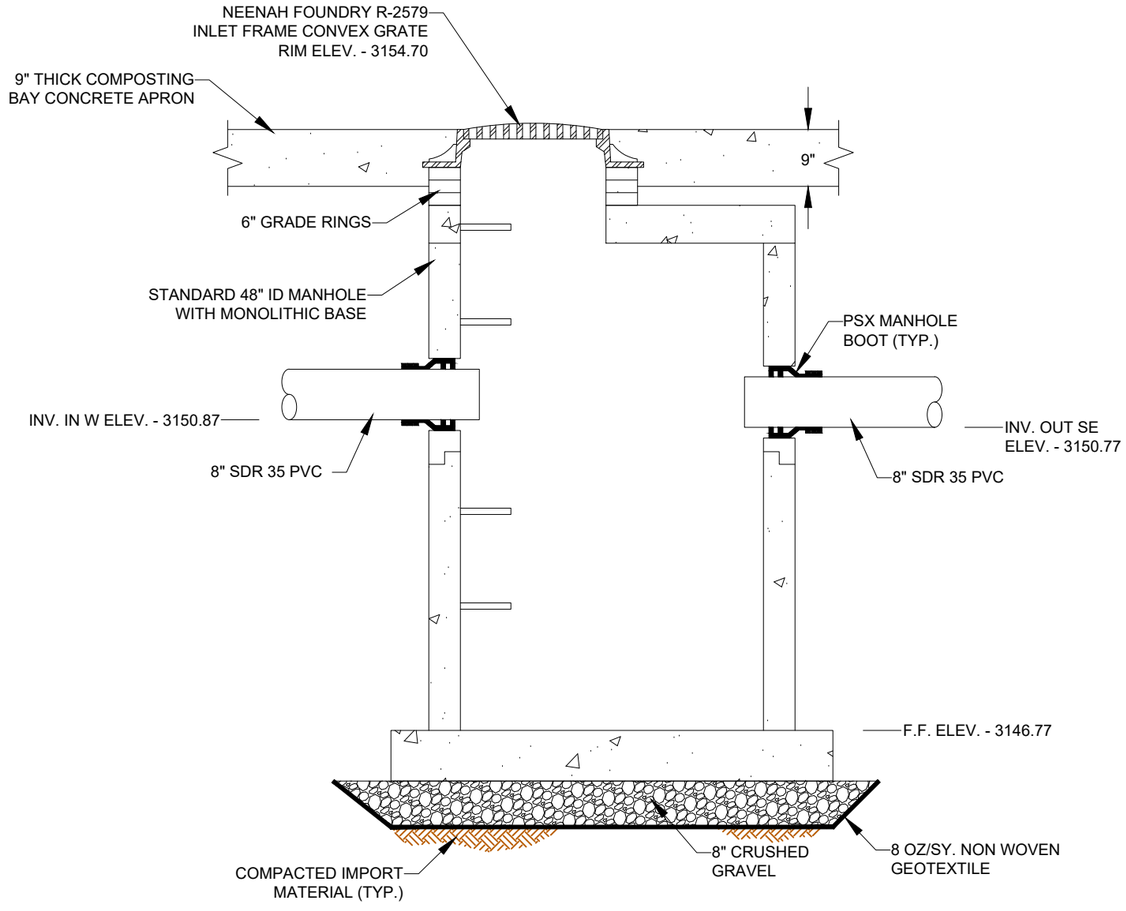
Sheet Title: **Catch Basin 1 Details**

Sheet: **CD-6**



Catch Basin 2 Plan 1

NOTE:
- CONCRETE HATCHING NOT SHOWN FOR DRAWING CLARITY.



Catch Basin 2 Section

1 0.5 0 1 2
Feet

NOTE:
- PIPES AND CONCRETE SLAB/APRON ROTATED FOR DRAWING CLARITY.

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

Engineer
Anderson~Montgomery
CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

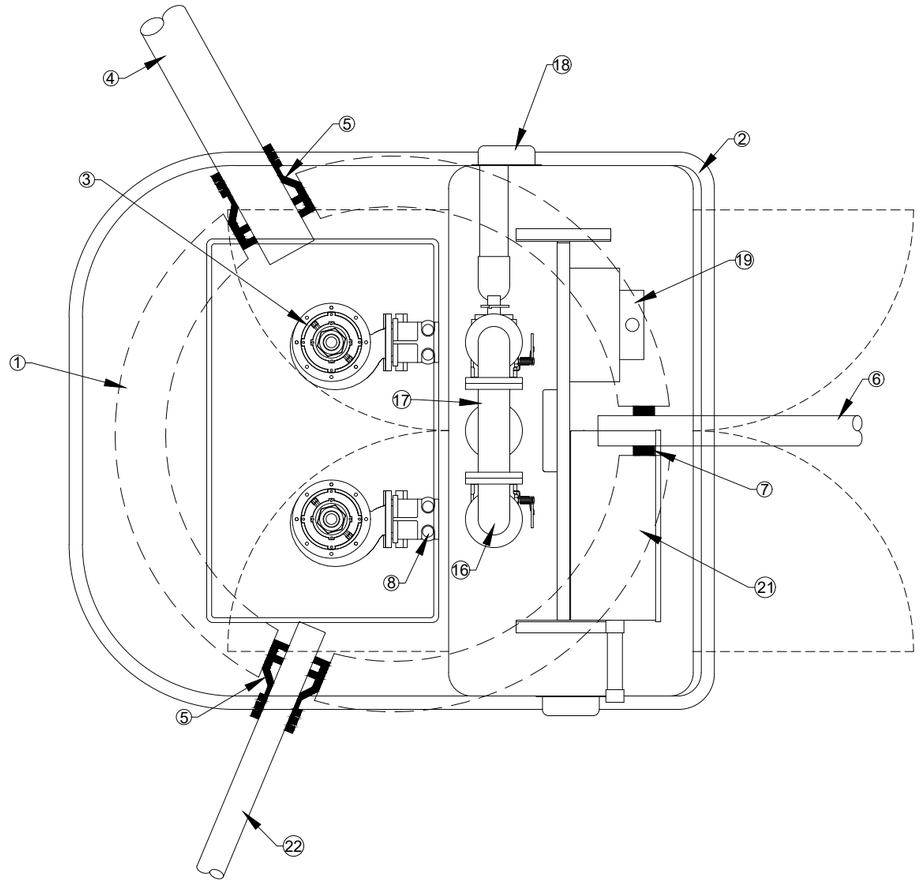
Sheet Title: **Catch Basin 2 Details**

Sheet: **CD-7**

CALLOUTS:
① - 6' DIAMETER CONCRETE STRUCTURE - 8" THICK MONOLITHIC BOTTOM
② - FIBERGLASS REINFORCED PLASTIC ENCLOSURE BY GORMAN RUPP
③ - VAUGHN CHOPPER PUMP WITH SLIDE RAIL - MODEL SK41 (TYP. OF 2)
④ - 8" SDR 35 PVC FROM CATCH BASIN 3 - INV. ELEV. 3149.95
⑤ - PSX MANHOLE BOOT
⑥ - 4" DI PIPE DISCHARGE - INV. ELEV. 3152.20
⑦ - LINKSEAL
⑧ - 2" SCH. 40 STEEL PIPE GUIDE RAIL WITH SUPPORT BRACKETS (TYP. OF 4)
⑨ - UPPER GUIDE RAIL BRACKET
⑩ - COMPACTED NATIVE MATERIAL
⑪ - 24" OF STRUCTURAL FILL
⑫ - PROPEX GEOTEXT 801 NON-WOVEN GEO-TEXTILE
⑬ - 8"x8" FILLET - NON-SHRINK GROUT
⑭ - 4" FLANGED CHECK VALVE (TYP. OF 2)
⑮ - 4" FLANGED PLUG VALVE (TYP. OF 2)
⑯ - 4" DI FL 90° BEND (TYP. OF 3)
⑰ - 4" DI FL TEE
⑱ - LIFT STATION VENT
⑲ - SUBMERSIBLE PUMP OIL RESERVOIR
⑳ - SUBMERSIBLE PUMP OIL HOSE (TYP. OF 2)
㉑ - LIFT STATION CONTROL PANEL
㉒ - 4" SDR 35 FROM CONDENSATE SUMP - INV. IN ELEV. 3146.00

NOTES:
- ALL FORCEMAIN PIPING SHALL BE 4" DUCTILE IRON
- ATTACH PUMP LIFTING CHAIN TO STRUCTURE AS PER MANUFACTURER'S RECOMMENDATIONS.
- MOUNT OIL RESERVOIR IN ABOVE GROUND STRUCTURE. ROUTE OIL HOSE PER MANUFACTURER'S RECOMMENDATIONS.
- PUMP SHALL UTILIZE A BASE BEND THAT IS COMPATIBLE WITH THE PIPING GALLERY ENCLOSURE.

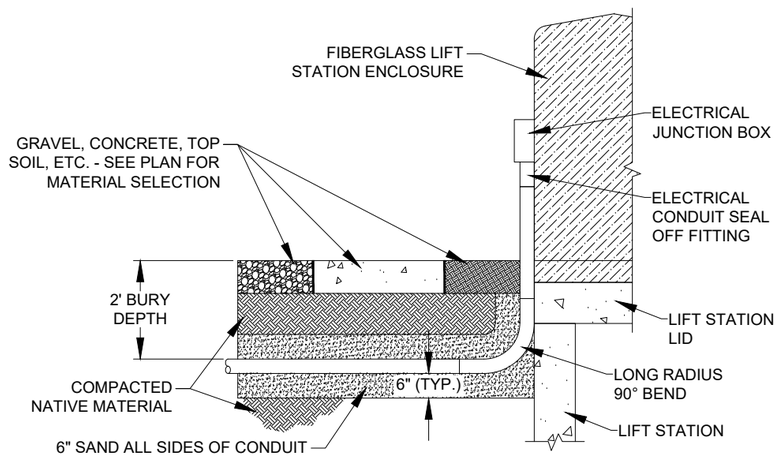
PUMP ELEVATIONS:
3149.50 - HIGH LEVEL ALARM
3148.00 - LAG PUMP ON
3147.00 - LEAD PUMP ON
3145.00 - LAG PUMP OFF
3144.00 - LEAD PUMP OFF
3143.00 - LOW LEVEL ALARM



Main Lift Station Plan 1

SCALE 1 0.5 0 1 2 Feet

N



Typical Conduit Detail 1
NO SCALE CD-9

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Owner
City Of Missoula

Project Title
Garden City Compost Facility Improvements

Sheet Title
Lift Station Plan

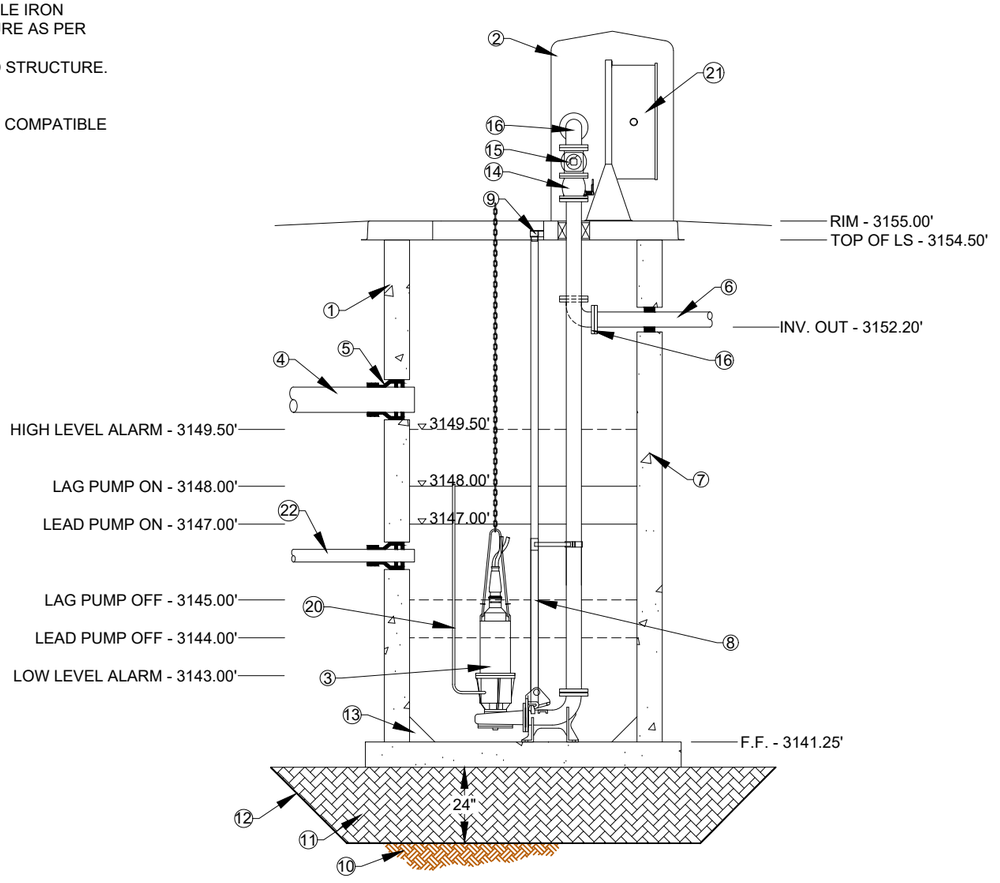
Sheet
CD-9

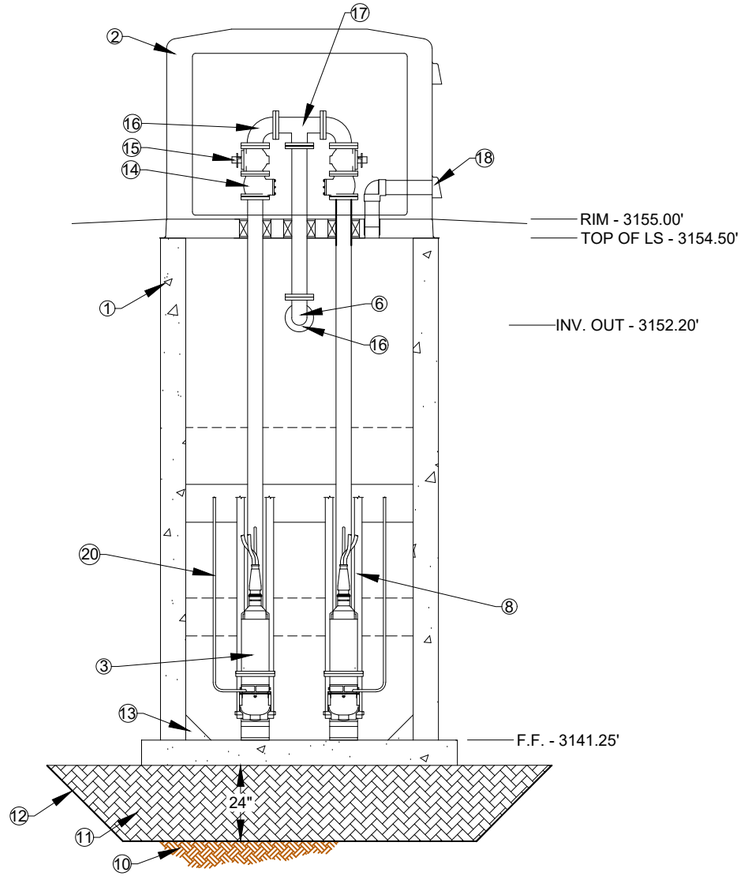
X:\MISSOULA COMPOST\DESIGN\DRAWINGS RE-BID\Sheets\5 - Civil Details\CD-9 & CD-10 Lift Station Details.dwg SAVED: 5/7/25 PRINTED: 5/12/25 BY: ADAM

CALLOUTS:
① - 6' DIAMETER CONCRETE STRUCTURE - 8" THICK MONOLITHIC BOTTOM
② - FIBERGLASS REINFORCED PLASTIC ENCLOSURE BY GORMAN RUPP
③ - VAUGHN CHOPPER PUMP WITH SLIDE RAIL - MODEL SK41 (TYP. OF 2)
④ - 8" SDR 35 PVC FROM CATCH BASIN 3 - INV. ELEV. 3149.95
⑤ - PSX MANHOLE BOOT
⑥ - 4" DI PIPE DISCHARGE - INV. ELEV. 3152.20
⑦ - LINKSEAL
⑧ - 2" SCH. 40 STEEL PIPE GUIDE RAIL WITH SUPPORT BRACKETS (TYP. OF 4)
⑨ - UPPER GUIDE RAIL BRACKET
⑩ - COMPACTED NATIVE MATERIAL
⑪ - 24" OF STRUCTURAL FILL
⑫ - PROPEX GEOTEXT 801 NON-WOVEN GEO-TEXTILE
⑬ - 8"x8" FILLET - NON-SHRINK GROUT
⑭ - 4" FLANGED CHECK VALVE (TYP. OF 2)
⑮ - 4" FLANGED PLUG VALVE (TYP. OF 2)
⑯ - 4" DI FL 90° BEND (TYP. OF 3)
⑰ - 4" DI FL TEE
⑱ - LIFT STATION VENT
⑲ - SUBMERSIBLE PUMP OIL RESERVOIR
⑳ - SUBMERSIBLE PUMP OIL HOSE (TYP. OF 2)
㉑ - LIFT STATION CONTROL PANEL
㉒ - 4" SDR 35 FROM CONDENSATE SUMP - INV. IN ELEV. 3146.00

NOTES:
- ALL FORCEMAIN PIPING SHALL BE 4" DUCTILE IRON
- ATTACH PUMP LIFTING CHAIN TO STRUCTURE AS PER MANUFACTURER'S RECOMMENDATIONS.
- MOUNT OIL RESERVOIR IN ABOVE GROUND STRUCTURE. ROUTE OIL HOSE PER MANUFACTURER'S RECOMMENDATIONS.
- PUMP SHALL UTILIZE A BASE BEND THAT IS COMPATIBLE WITH THE PIPING GALLERY ENCLOSURE.

PUMP ELEVATIONS:
3149.50 - HIGH LEVEL ALARM
3148.00 - LAG PUMP ON
3147.00 - LEAD PUMP ON
3145.00 - LAG PUMP OFF
3144.00 - LEAD PUMP OFF
3143.00 - LOW LEVEL ALARM





Main Lift Station Sections A CD-9

SCALE 2 1 0 2 4 Feet

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

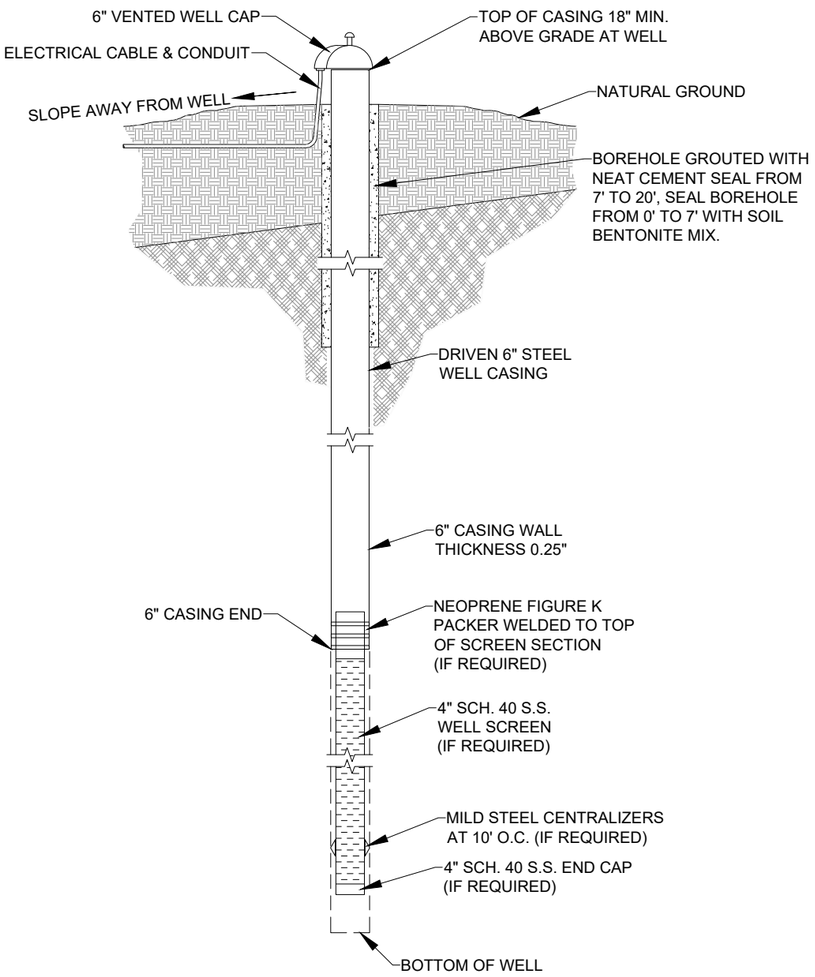
Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Owner: City Of Missoula

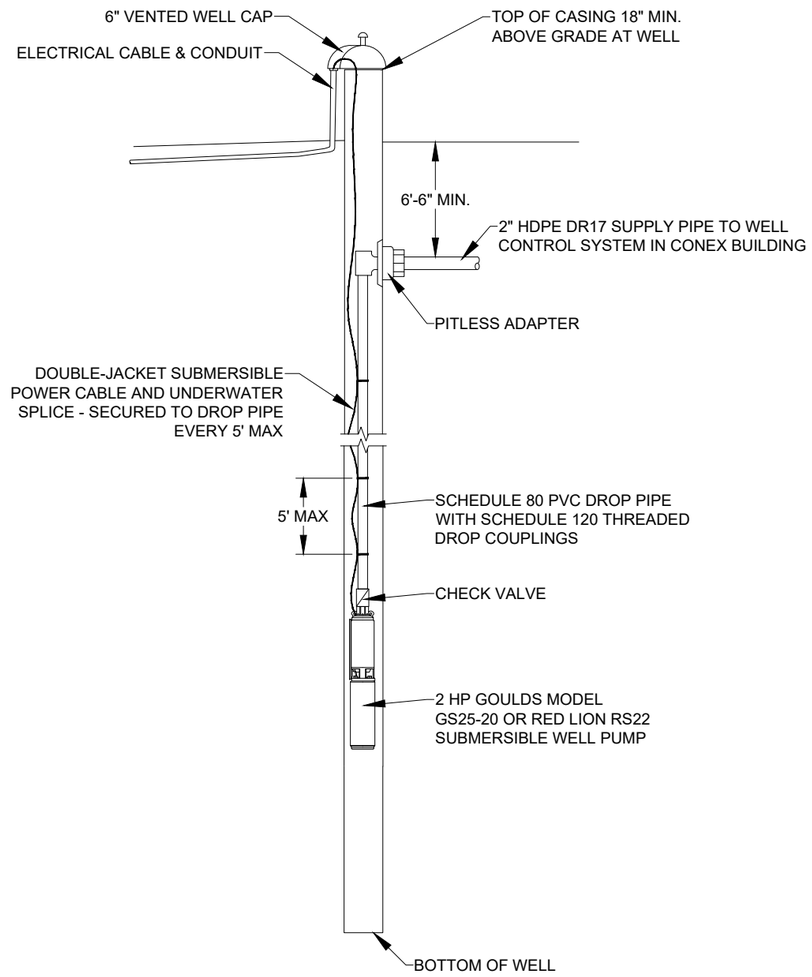
Project Title: Garden City Compost Facility Improvements

Sheet Title: **Lift Station Section**

Sheet: **CD-10**



New Well Construction Detail 1
NO SCALE C-9



New Well Plumbing Detail 2
NO SCALE CD-12

GENERAL WELL NOTES:

- CONSTRUCT WELL IN ACCORDANCE WITH THE WELL DRILLER'S REGULATIONS, ARM 36 CHAPTER 21
- ALL DIMENSIONS AND PIPE LENGTHS ARE TO BE ESTABLISHED IN THE FIELD AFTER WELL IS DRILLED AND LITHOLOGY IS KNOWN.
- PUMP POWER CABLE SHALL BE THWN OR THHN INSULATED AND ATTACHED TO PUMP DROP PIPE AT NO GREATER THAN 10-FOOT INTERVALS.

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

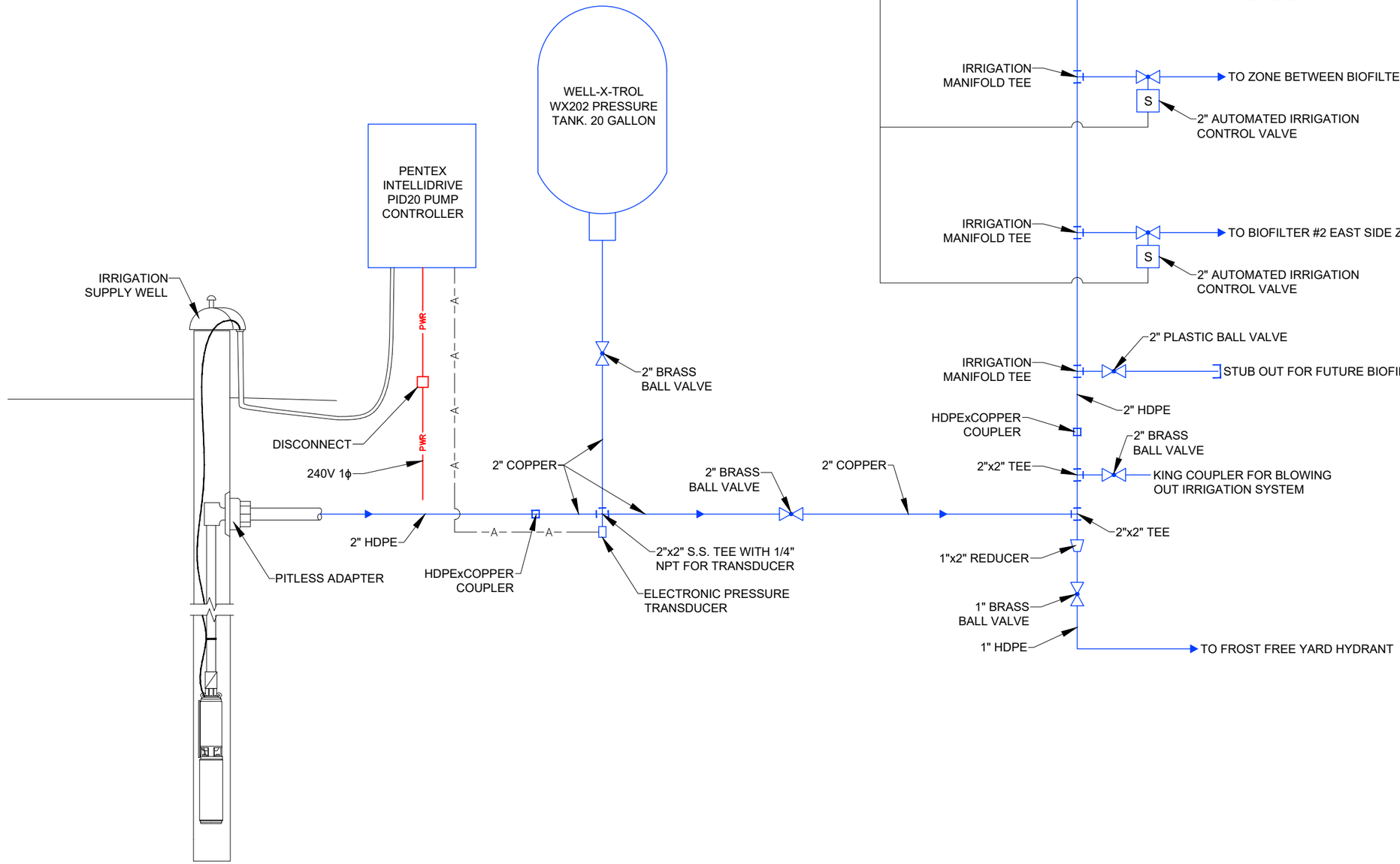
Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Irrigation Well Details**

Sheet: **CD-12**



Irrigation Plumbing Diagram

1

NO SCALE

C-9

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

Engineer

Anderson~Montgomery CONSULTING ENGINEERS

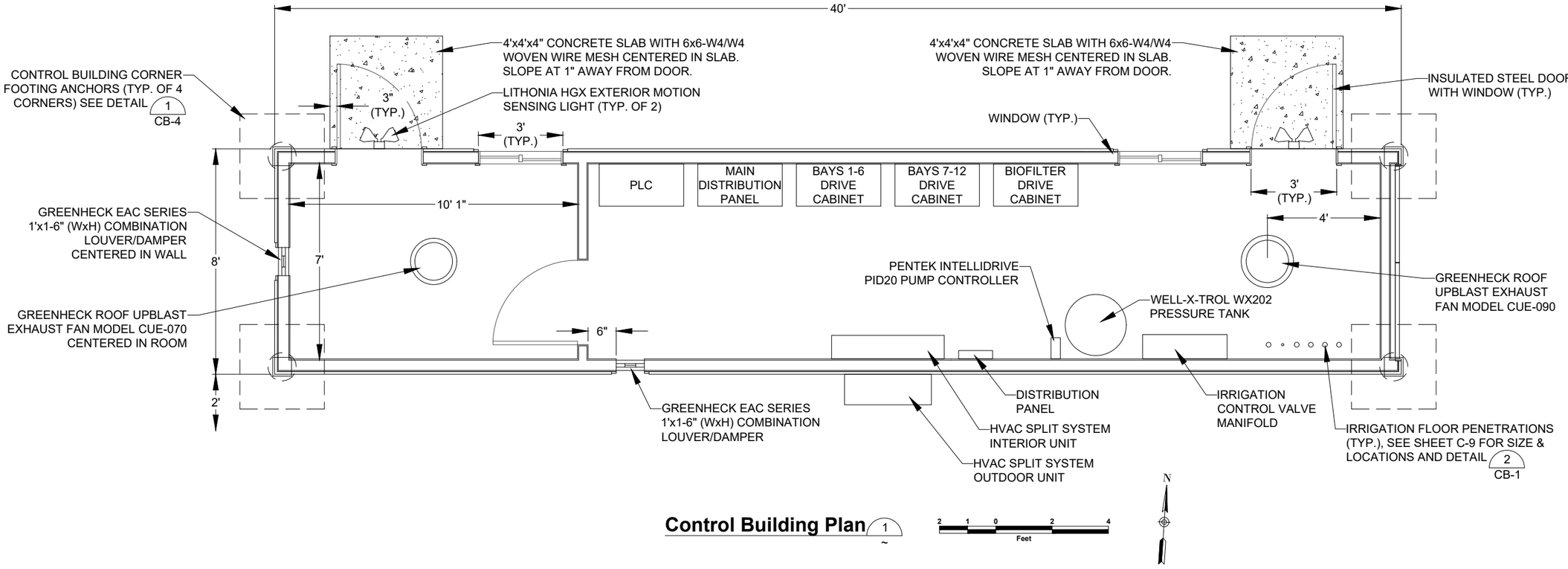
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Owner: City Of Missoula

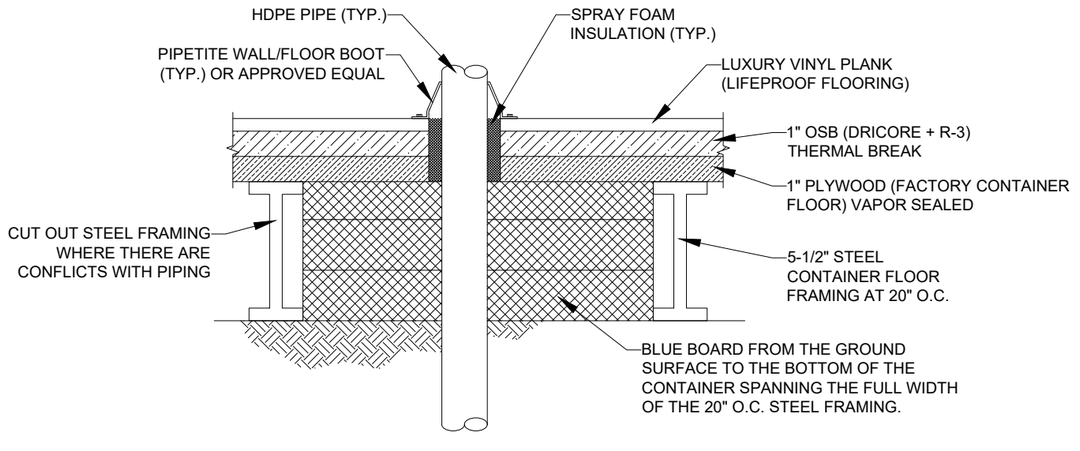
Project Title: Garden City Compost Facility Improvements

Sheet Title: **Irrigation Plumbing Diagram**

Sheet: **CD-13**



Control Building Plan 1



Control Building Floor Penetration 2 CB-1

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

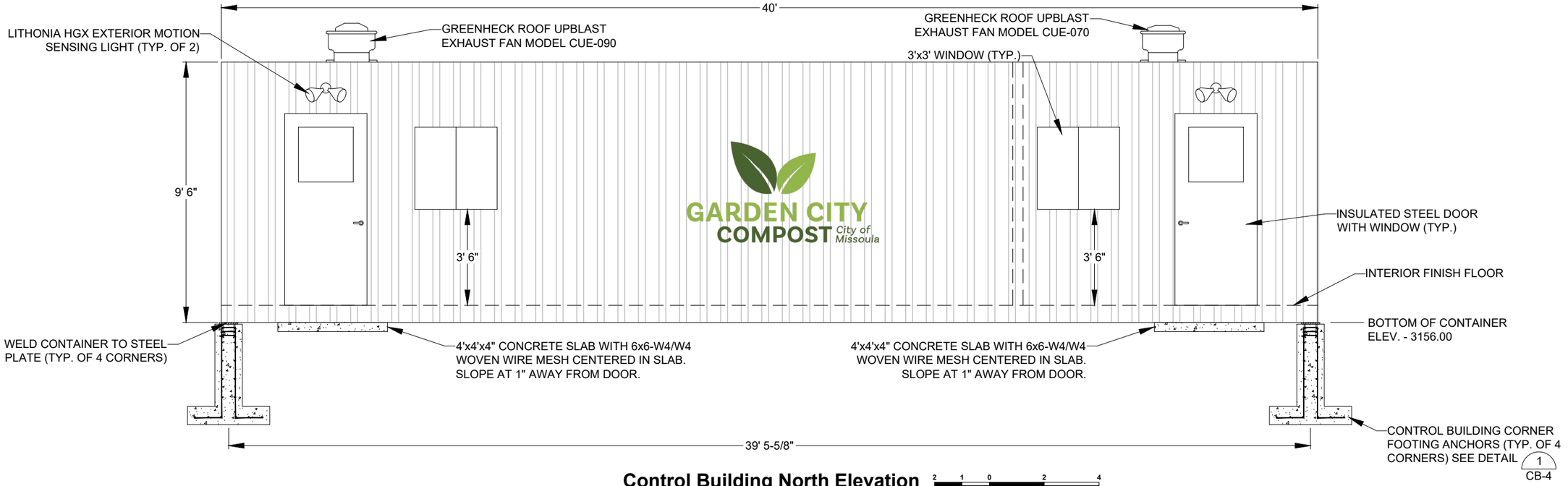
Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

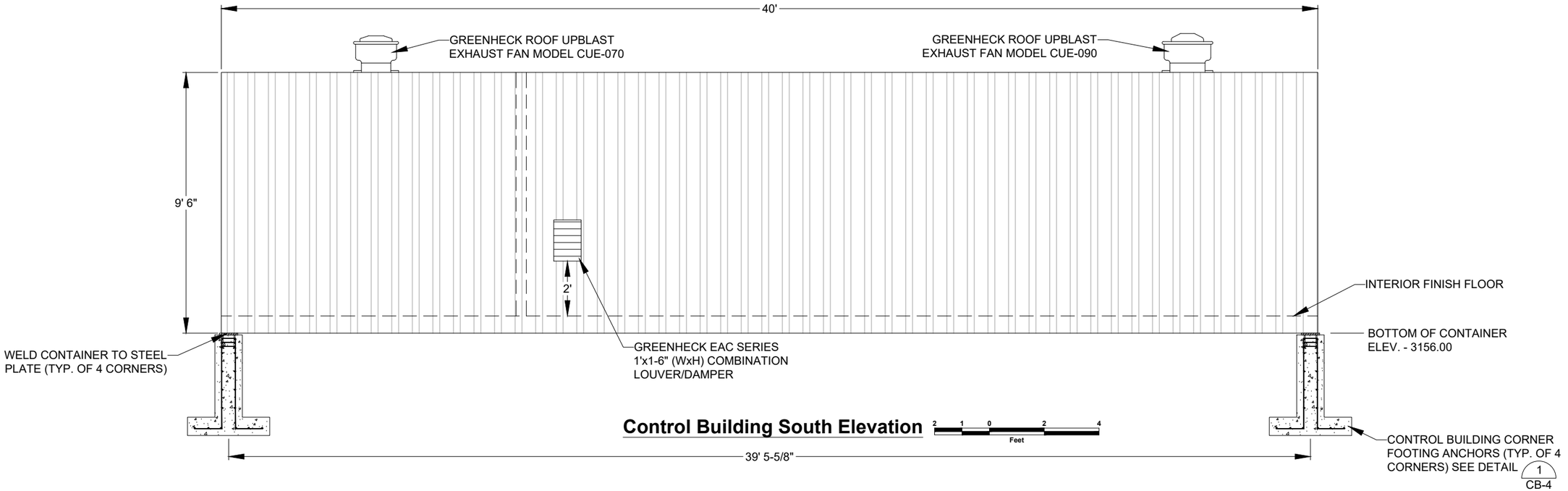
Sheet Title: **Control Building Plan**

Sheet: **CB-1**



Control Building North Elevation

2 1 0 2 4
Feet



Control Building South Elevation

2 1 0 2 4
Feet

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

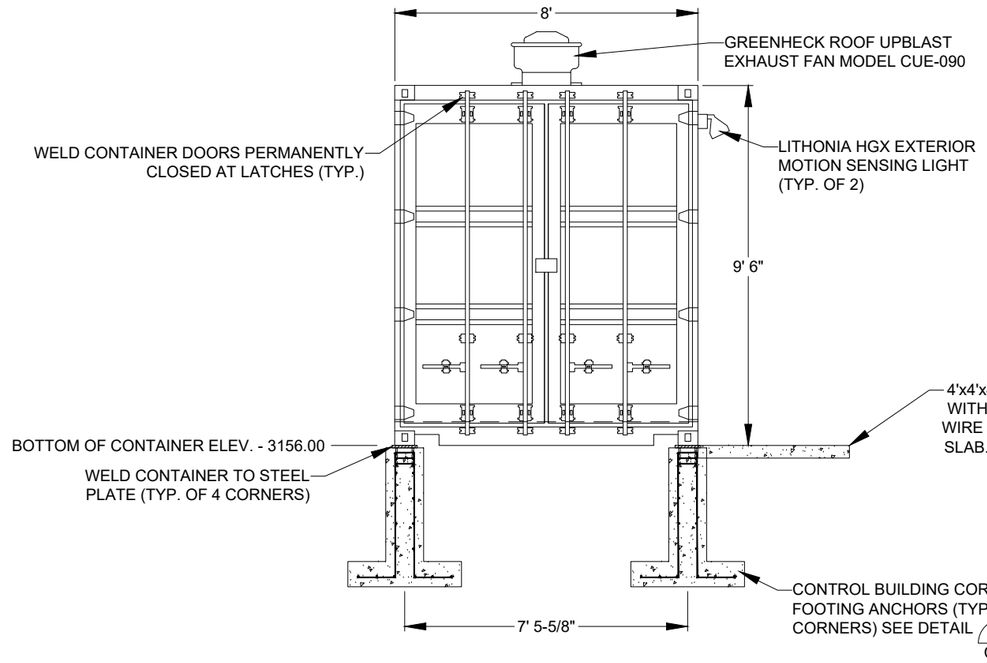
Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

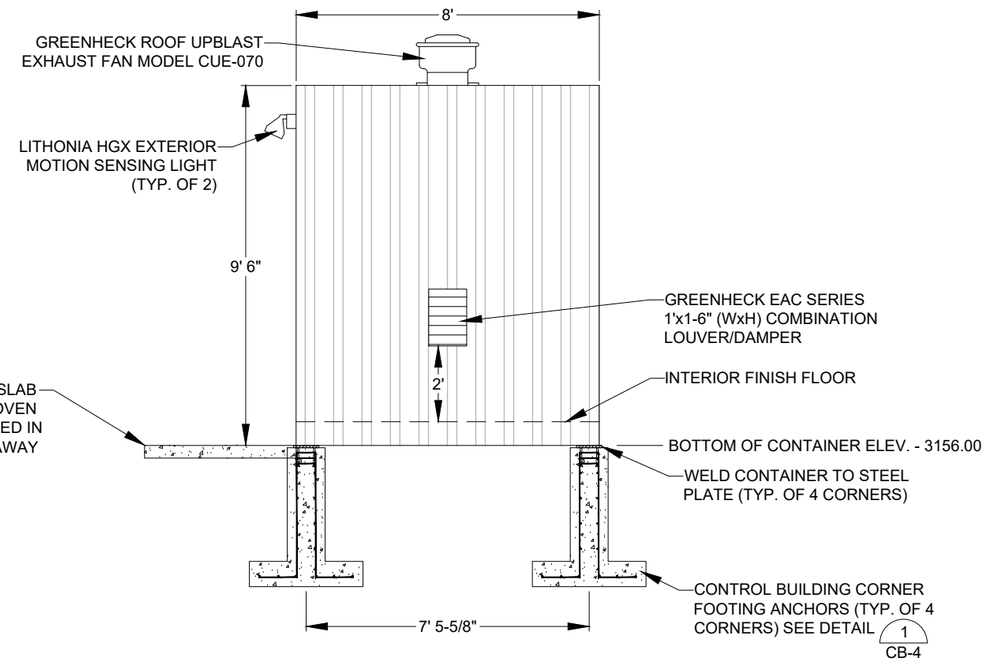
Sheet Title: **Control Building North & South Elevations**

Sheet: **CB-2**



Control Building East Elevation

2 1 0 2 4
Feet



Control Building West Elevation

2 1 0 2 4
Feet

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

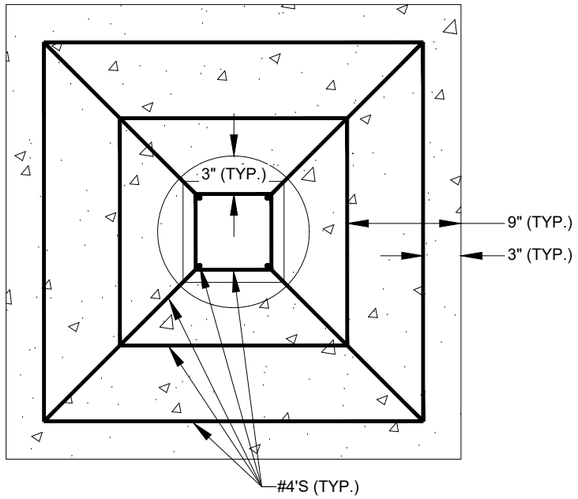
Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

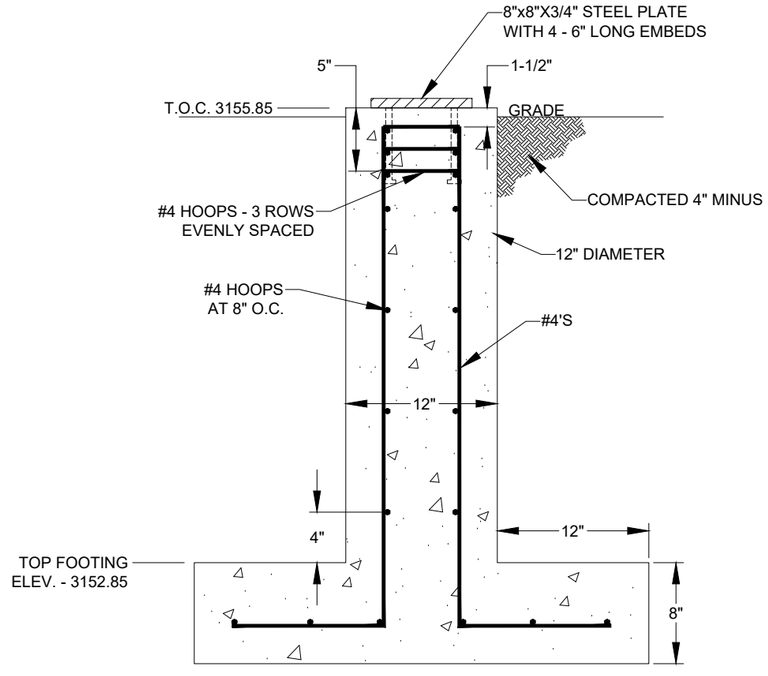
Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Control Building East & West Elevations**

Sheet: **CB-3**





Control Building Corner Footing Anchors

1

NO SCALE

X:\MISSOULA COMPOST\DESIGN\DRAWINGS RE-BID\Sheets\6 - Control Building\CB-1 Control Building.dwg SAVED:5/6/25 PRINTED:5/7/25 BY:ADAM

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Designed By: P.Montgomery, P.E.

Engineer
Anderson~Montgomery
CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

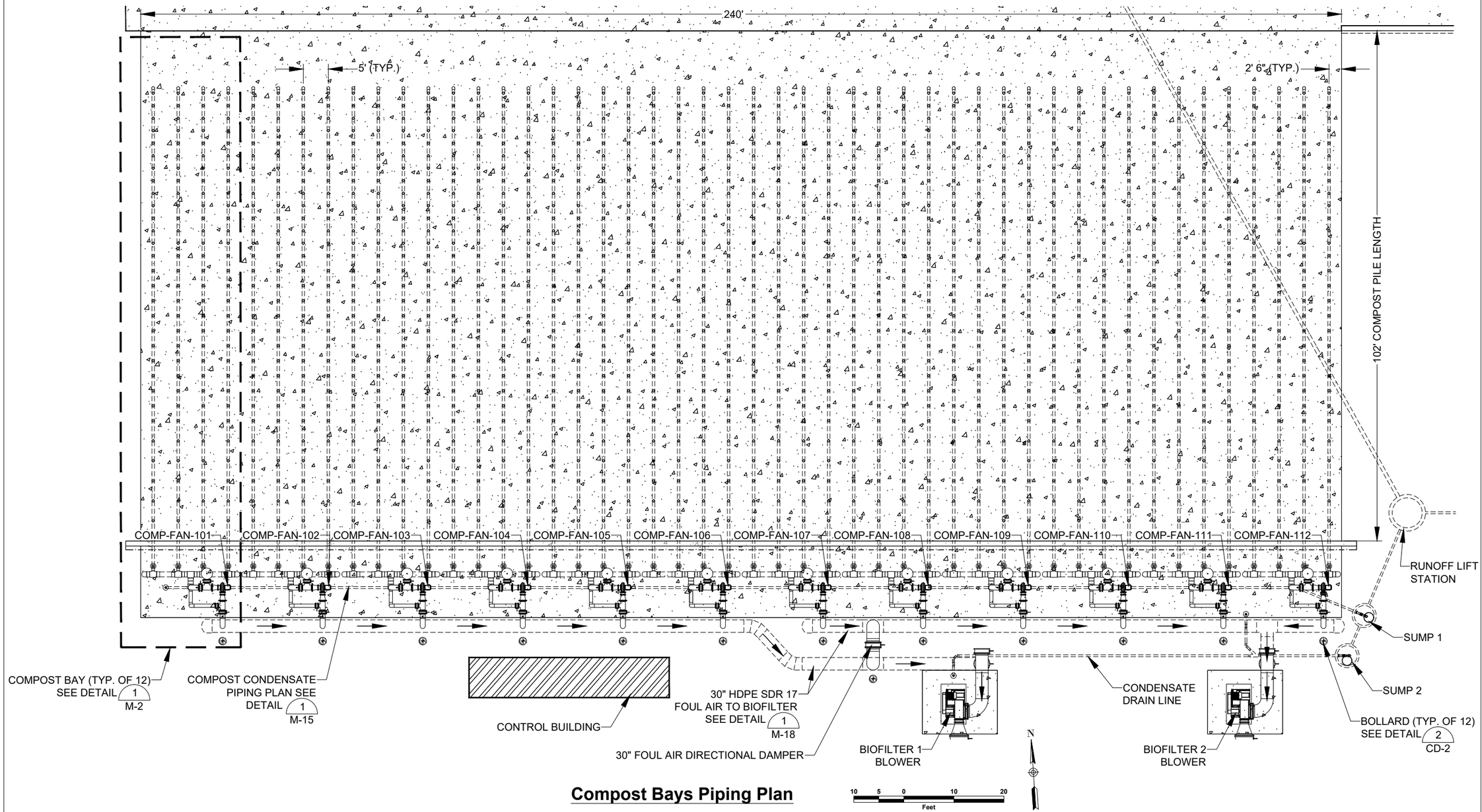
Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Control Building Anchors**

Sheet: **CB-4**

NOTE:
THREE WIRELESS TEMPERATURE PROBES ARE TO BE INSTALLED INTO EACH BAY AFTER PLACEMENT OF THE COMPOST MIX. NO INSTALLATION OR PERMANENT HARDWARE IS REQUIRED.



Compost Bays Piping Plan

NOTE:
CONTRACTOR SHALL INSTALL HDPE VALVE SPACERS FOR THE BURIED BUTTERFLY VALVE. CONTRACTOR SHALL VERIFY VALVE OPERATES PROPERLY WITHOUT INTERFERENCE BEFORE BACKFILLING.

MONTANA
John R. Gedak
No. 12132PE
2/12/25
LICENSED PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Checked By: T.Williams, P.E.
Designed By: P.Montgomery, P.E.
Designed By: T.Pipher, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

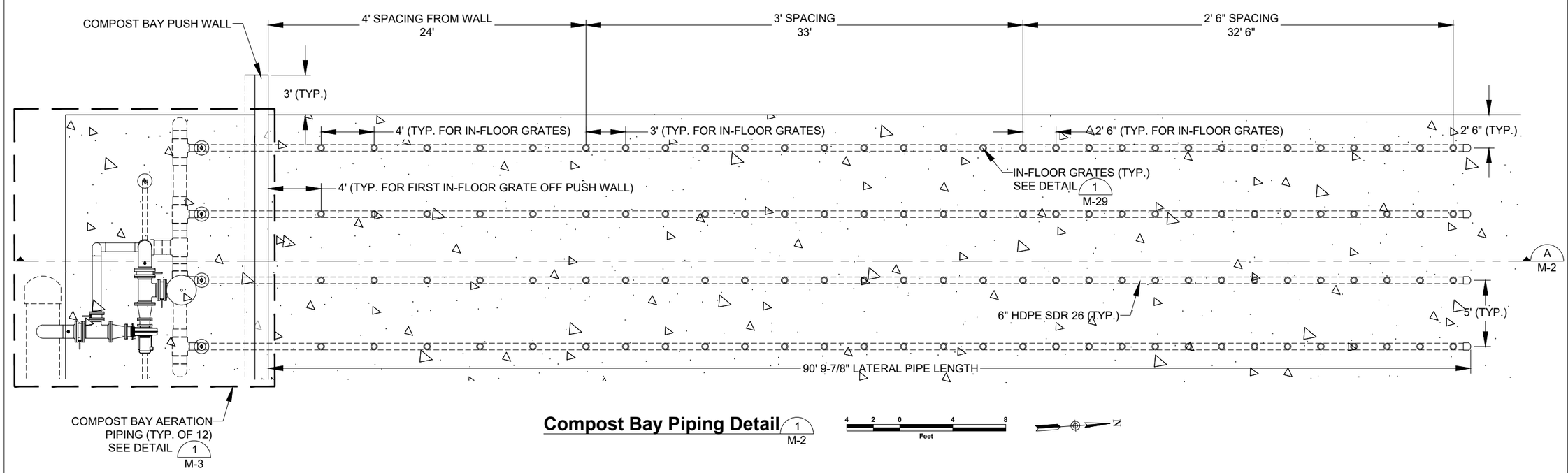
Jacobs
999 Main Street
STE. 1200
Boise, ID 83702
Phone (406) 212-4520

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

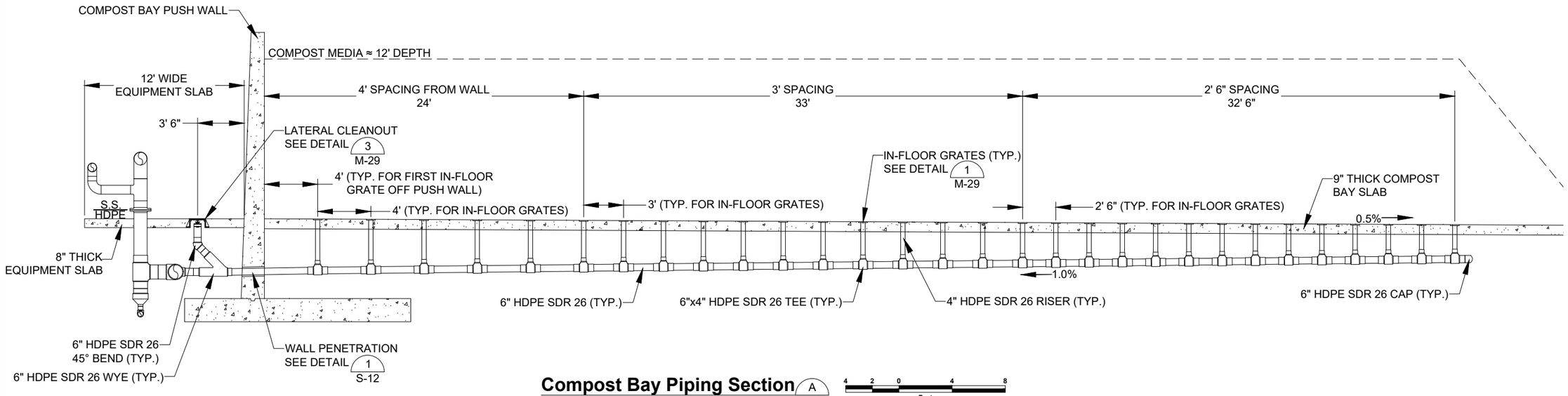
Sheet Title: **Compost Bays Piping**

Sheet: **M-1**



Compost Bay Piping Detail 1 M-2

4 2 0 4 8
Feet



Compost Bay Piping Section A M-2

4 2 0 4 8
Feet

NOTES:
- SEE SHEETS M-3 AND M-4 FOR BLOWER AND AEARTION PIPING GALLERY
- COMPOST PILE LENGTH - 100'

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Checked By: T.Williams, P.E.
Designed By: P.Montgomery, P.E.
Designed By: T.Pipher, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Jacobs
999 Main Street
STE. 1200
Boise, ID 83702
Phone (406) 212-4520

Owner: City Of Missoula

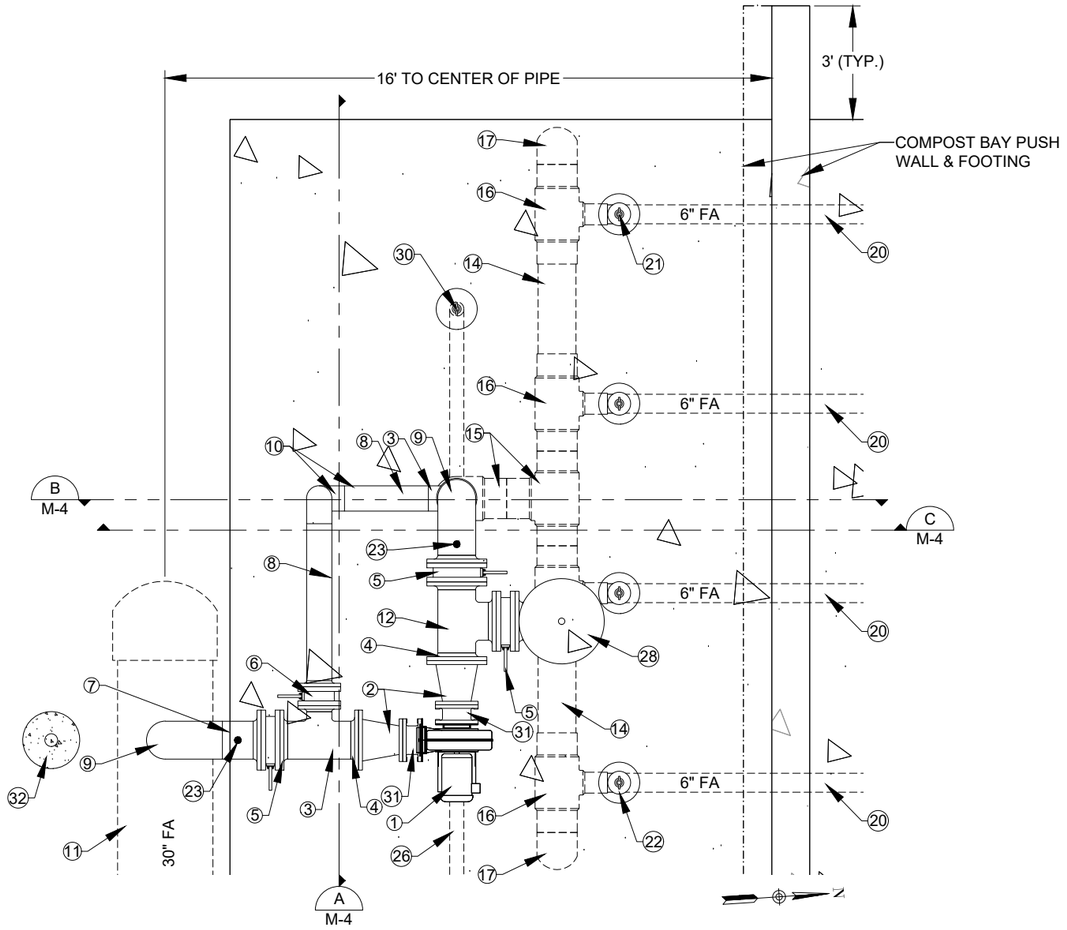
Project Title: Garden City Compost Facility Improvements

Sheet Title: **Compost Bay Piping Details**

Sheet: **M-2**

CALLOUTS:
① - COMP-FAN-X: 5 HP BLOWER (CINCINNATI PB-15A4 CW BH OR PRE-APPROVED EQUAL)
② - 8"x12" S.S. 16 GAUGE DUCT
③ - 12"x12"x8" S.S. 16 GAUGE DUCT TEE
④ - FLxS.S. ADAPTER (TYP. ALL TRANSITIONS FROM S.S. TO FLANGE FITTINGS)
⑤ - 12" FLxFL DAMPER (GREENHECK HCDR-250 OR EQUAL)
⑥ - 8" FLxFL DAMPER (GREENHECK HCDR-250 OR EQUAL)
⑦ - 12" S.S. 16 GAUGE DUCT FIELD FIT
⑧ - 8" S.S. 16 GAUGE DUCT FIELD FIT
⑨ - 12" S.S. 16 GAUGE DUCT 90° BEND
⑩ - 8" S.S. 16 GAUGE DUCT SHORT RADIUS 90° BEND
⑪ - 30" HDPE SDR 26
⑫ - 12" S.S. 16 GAUGE DUCT TEE
⑬ - 12" S.S. TO 16" HDPE SDR 26 ADAPTER
⑭ - 12" HDPE SDR 26 FIELD FIT
⑮ - 12" HDPE SDR 26 BUTT FUSE TEE
⑯ - 12"x12"x6" HDPE SDR 26 BUTT FUSE TEE
⑰ - 12" HDPE SDR 26 BUTT FUSE CAP
⑱ - 6" HDPE SDR 26 BUTT FUSE WYE
⑲ - 6" HDPE SDR 26 45° BEND
⑳ - 6" HDPE SDR 26 PIPE FIELD FIT
㉑ - 6" WING NUT PIPE PLUG (TYP.)
㉒ - CLEANOUT FRAME (TYP.)
㉓ - FOUL AIR TEST PORT SEE DETAIL 4/M-29
㉔ - 12"x4" HDPE SDR 26 BUTT FUSE REDUCER
㉕ - 4" HDPE SDR 26 BUTT FUSE TEE (TYP.)
㉖ - 4" HDPE SDR 26 BUTT FUSE 45° BEND (TYP.)
㉗ - 4" HDPE SDR 26 CONDENSATE PIPING
㉘ - 12" ENDUSTRA INTAKE FILTER WITH S.S. MEDIA OR APPROVED EQUAL
㉙ - 12" S.S. 16 GAUGE DUCT SHORT RADIUS 90° BEND
㉚ - 4" WING NUT PIPE PLUG
㉛ - HOLZ FLEXIBLE JOINT STYLE 942 OR EQUAL
㉜ - PIPE BOLLARD SEE DETAIL 2/CD-2

NOTE:
- CONDENSATE PIPING ELEVATION VARIES SEE COMPOST CONDENSATE DRAWINGS FOR DETAILS. SHEETS M-15 THROUGH M-16.
- ALL FLANGE ADAPTERS SHALL UTILIZE AN IRON FLANGE.
- ALL PIPES PASSING THROUGH A CONCRETE SLAB SHALL UTILIZE A SLEEVE, SEE CIVIL DETAILS.



Compost Bay Aeration Piping Detail 1/M-2

2 1 0 2 4
Feet

MONTANA John R. Gedak NO. 12132PE 2/12/25 LICENSED PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Checked By: T.Williams, P.E.
Designed By: P.Montgomery, P.E.
Designed By: T.Pipher, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Jacobs
999 Main Street
STE. 1200
Boise, ID 83702
Phone (406) 212-4520

Owner
City Of Missoula

Project Title
Garden City Compost Facility Improvements

Sheet Title
Compost Bay Aeration Piping Details

Sheet
M-3

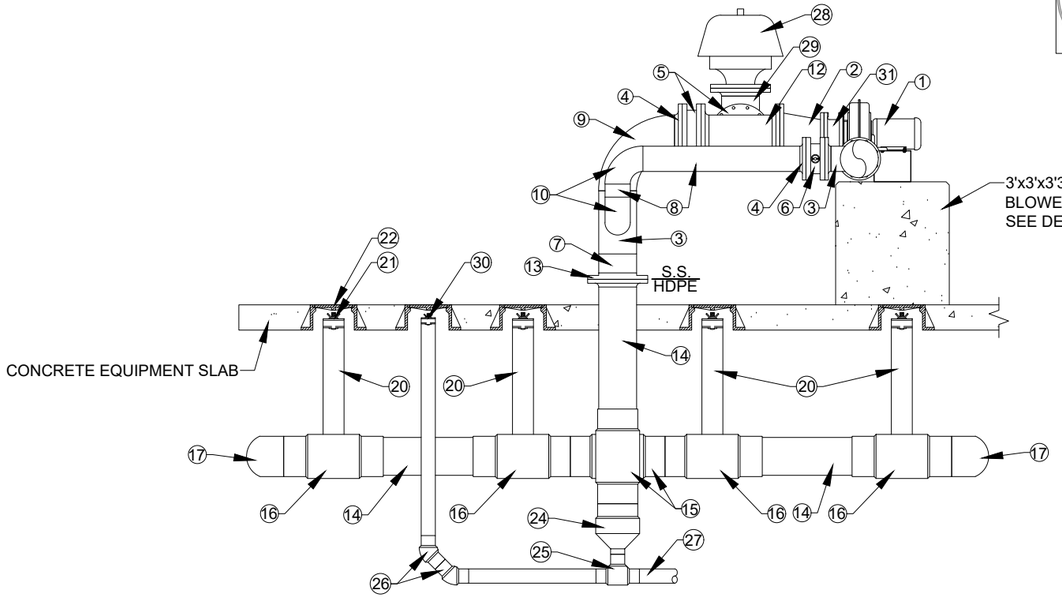
X:\MISSOULA COMPOST\DESIGN\DRAWINGS RE-BID\Sheets\7 - Mechanical\M-3 Compost Bay Aeration Piping Details.dwg SAVED:5/6/25 PRINTED:5/7/25 BY:ADAM

CALLOUTS:

① - COMP-FAN-X: 5 HP BLOWER (CINCINNATI PB-15A4 CW BH OR PRE-APPROVED EQUAL)
② - 8"x12" S.S. 16 GAUGE DUCT
③ - 12"x12"x8" S.S. 16 GAUGE DUCT TEE
④ - FLxS.S. ADAPTER (TYP. ALL TRANSITIONS FROM S.S. TO FLANGE FITTINGS)
⑤ - 12" FLxFL DAMPER (GREENHECK HCDR-250 OR EQUAL)
⑥ - 8" FLxFL DAMPER (GREENHECK HCDR-250 OR EQUAL)
⑦ - 12" S.S. 16 GAUGE DUCT FIELD FIT
⑧ - 8" S.S. 16 GAUGE DUCT FIELD FIT
⑨ - 12" S.S. 16 GAUGE DUCT 90° BEND
⑩ - 8" S.S. 16 GAUGE DUCT SHORT RADIUS 90° BEND
⑪ - 30" HDPE SDR 26
⑫ - 12" S.S. 16 GAUGE DUCT TEE
⑬ - 12" S.S. TO 16" HDPE SDR 26 ADAPTER
⑭ - 12" HDPE SDR 26 FIELD FIT
⑮ - 12" HDPE SDR 26 BUTT FUSE TEE
⑯ - 12"x12"x6" HDPE SDR 26 BUTT FUSE TEE
⑰ - 12" HDPE SDR 26 BUTT FUSE CAP
⑱ - 6" HDPE SDR 26 BUTT FUSE WYE
⑲ - 6" HDPE SDR 26 45° BEND
⑳ - 6" HDPE SDR 26 PIPE FIELD FIT
㉑ - 6" WING NUT PIPE PLUG (TYP.)
㉒ - CLEANOUT FRAME (TYP.)
㉓ - FOUL AIR TEST PORT SEE DETAIL 4/M-29
㉔ - 12"x4" HDPE SDR 26 BUTT FUSE REDUCER
㉕ - 4" HDPE SDR 26 BUTT FUSE TEE (TYP.)
㉖ - 4" HDPE SDR 26 BUTT FUSE 45° BEND (TYP.)
㉗ - 4" HDPE SDR 26 CONDENSATE PIPING
㉘ - 12" ENDUSTRA INTAKE FILTER WITH S.S. MEDIA OR APPROVED EQUAL
㉙ - 12" S.S. 16 GAUGE DUCT SHORT RADIUS 90° BEND
㉚ - 4" WING NUT PIPE PLUG
㉛ - HOLZ FLEXIBLE JOINT STYLE 942 OR EQUAL
㉜ - PIPE BOLLARD SEE DETAIL 2/CD-2

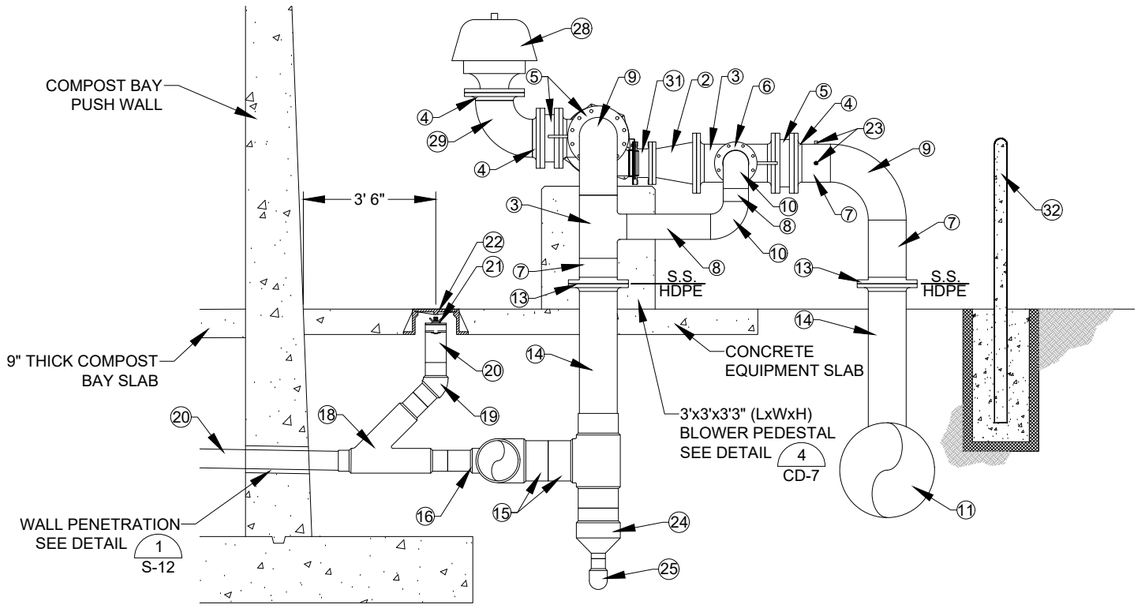
NOTE:

- CONDENSATE PIPING ELEVATION VARIES SEE COMPOST CONDENSATE DRAWINGS FOR DETAILS. SHEETS M-15 THROUGH M-16.
- ALL FLANGE ADAPTERS SHALL UTILIZE AN IRON FLANGE.
- ALL PIPES PASSING THROUGH A CONCRETE SLAB SHALL UTILIZE A SLEEVE, SEE CIVIL DETAILS.
- PIPE SUPPORTS NOT SHOWN FOR DRAWING CLARITY. CONTRACTOR SHALL RECOMMEND SUPPORT LOCATIONS TO BE APPROVED BY ENGINEER.



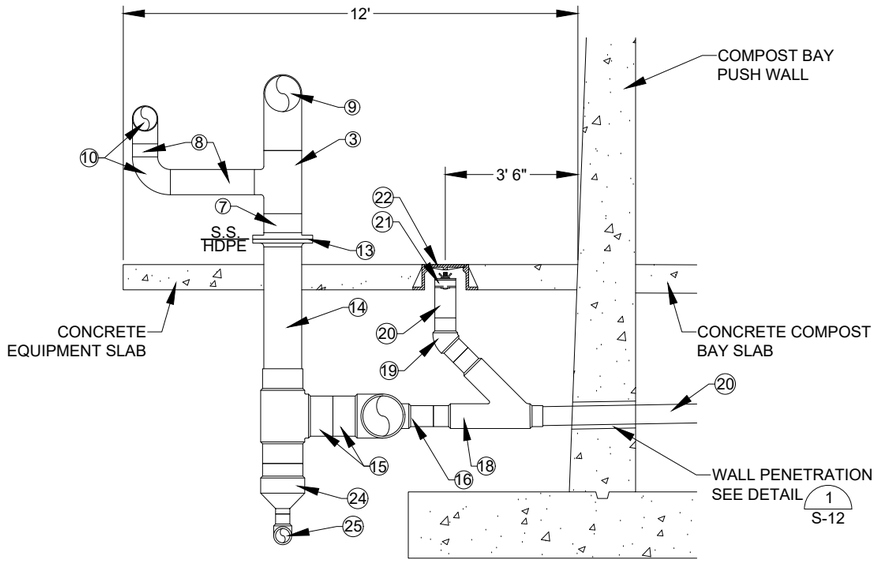
Compost Bay Aeration Piping Section A / M-3

2 1 0 2 4
Feet



Compost Bay Aeration Piping Section B / M-3

2 1 0 2 4
Feet



Compost Bay Aeration Piping Section C / M-3

2 1 0 2 4
Feet

MONTANA
John R. Gedak
NO. 72132PE
2/12/25
LICENSED
PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Checked By: T.Williams, P.E.
Designed By: P.Montgomery, P.E.
Designed By: T.Pipher, P.E.

Engineer
Anderson~Montgomery
CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Jacobs
999 Main Street
STE. 1200
Boise, ID 83702
Phone (406) 212-4520

Owner
City Of Missoula

Project Title
Garden City Compost Facility Improvements

Sheet Title
Compost Bay Aeration Piping Sections

Sheet
M-4

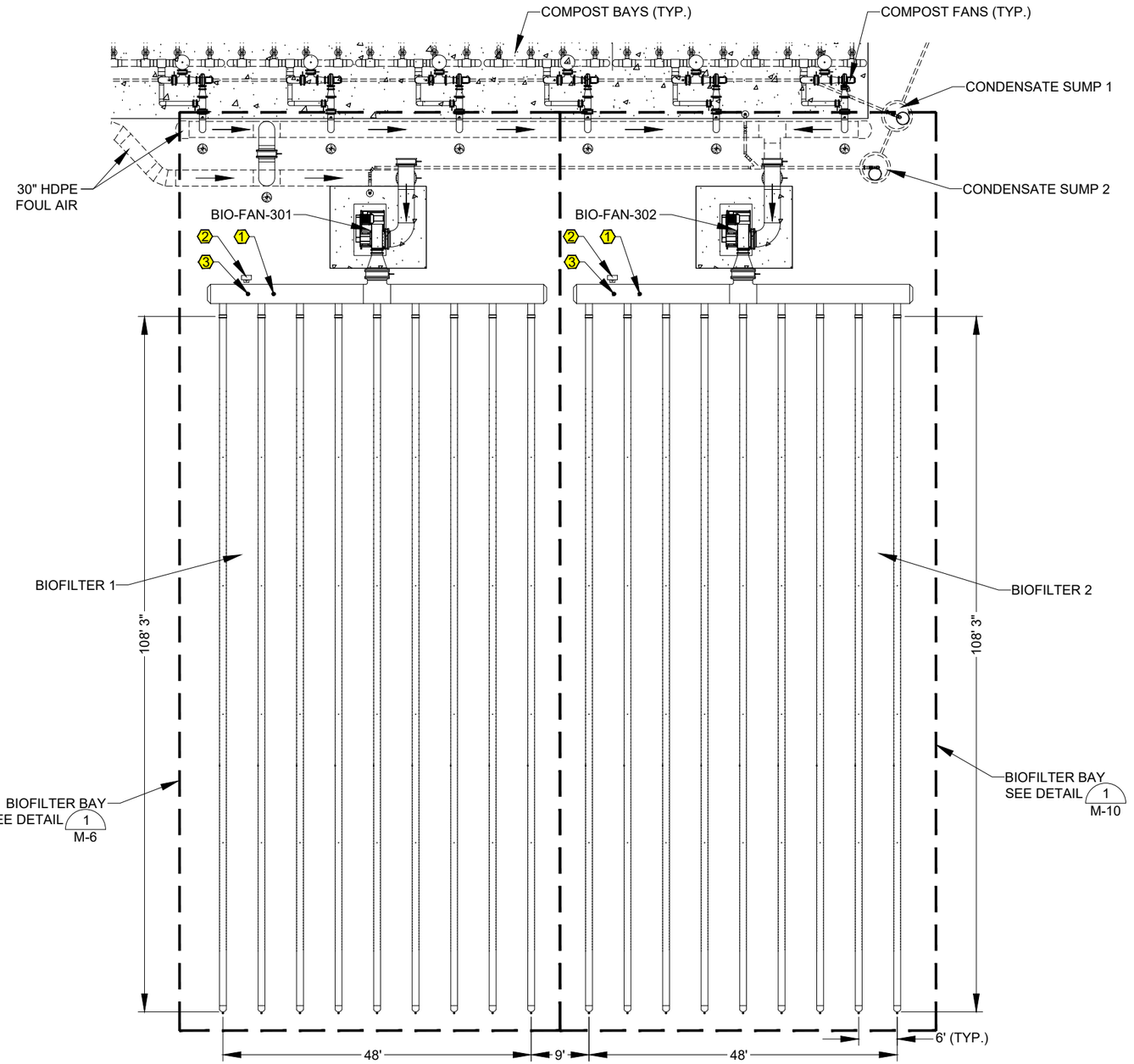
X:\MISSOULA COMPOST\DESIGN\DRAWINGS RE-BID\Sheets\7 - Mechanical\M-4 Compost Bay Aeration Sections.dwg SAVED:5/6/25 PRINTED:5/7/25 BY:ADAM

INSTRUMENT LEGEND:

1 - PRESSURE TRANSMITTER PIT-101/102 SEE DETAILS 1 2 M-30 M-30

2 - TEMPERATURE TRANSMITTER TIT-113/114 SEE DETAIL 4 M-30

3 - TEMPERATURE ELEMENT TE-113/114 SEE DETAIL 3 M-30



Biofilter Bays Piping Plan

10 5 0 10 20
Feet

N

MONTANA
John R. Gedak
NO. 72132PE
2/12/25
LICENSED PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Checked By: T.Williams, P.E.
Designed By: P.Montgomery, P.E.
Designed By: T.Pipher, P.E.

Engineer
Anderson~ Montgomery
CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

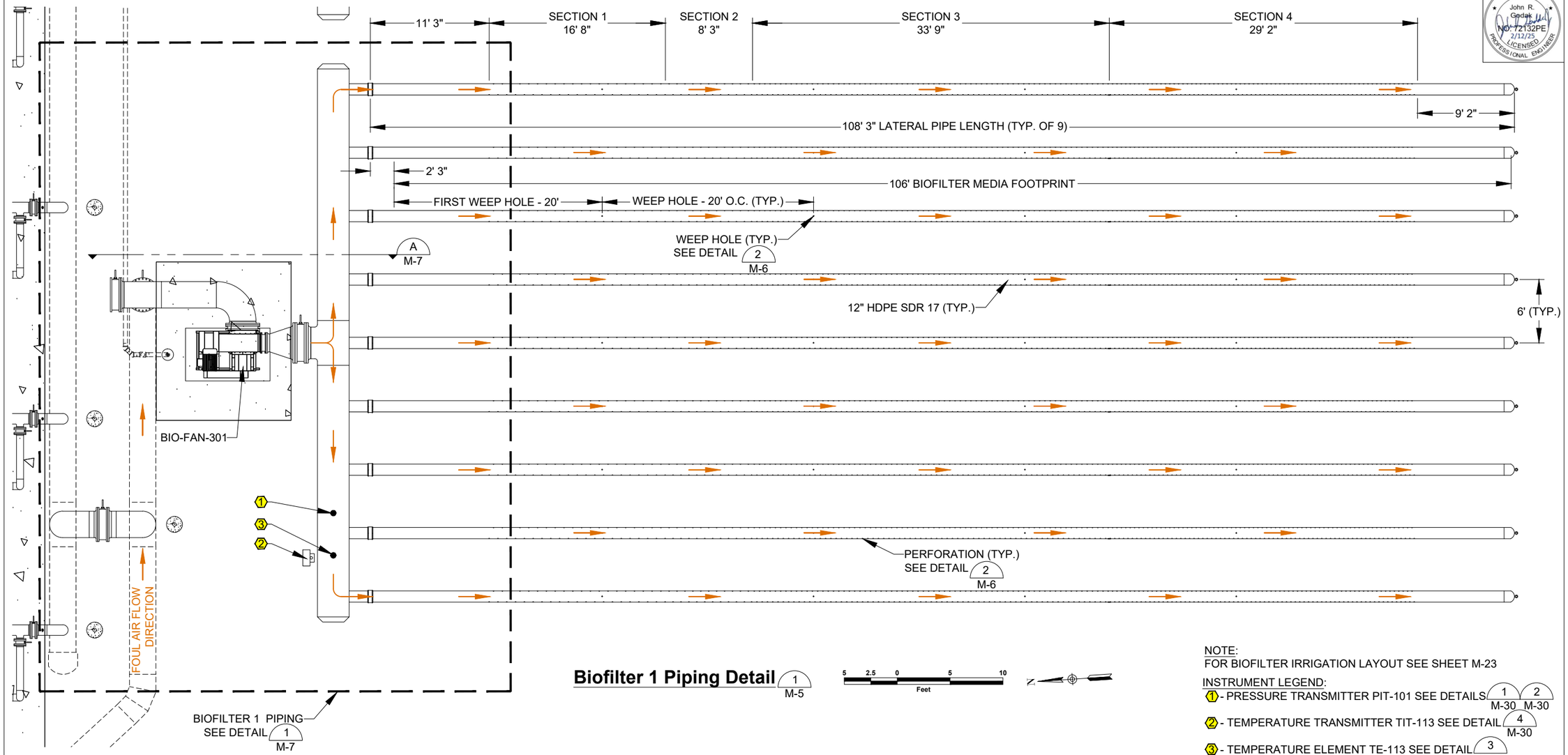
Jacobs
999 Main Street
STE. 1200
Boise, ID 83702
Phone (406) 212-4520

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Biofilter Bays Piping**

Sheet: **M-5**

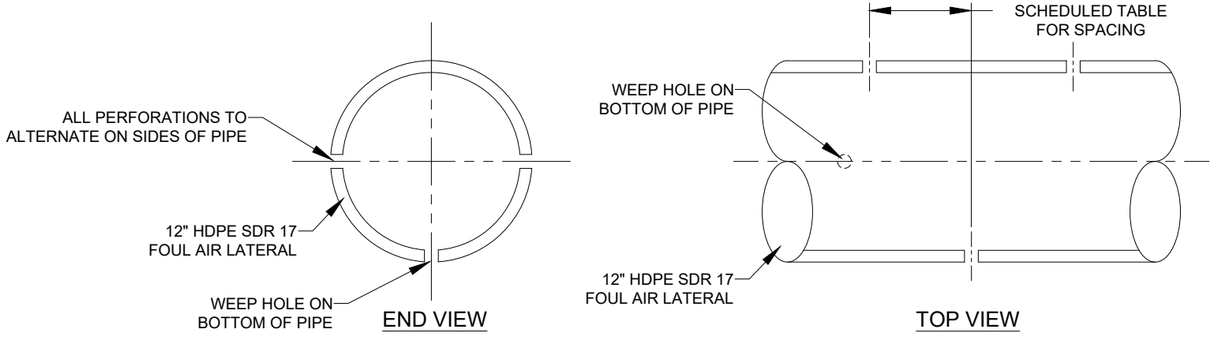


Biofilter 1 Piping Detail 1 M-5

Feet: 5 2.5 0 5 10

NOTE:
FOR BIOFILTER IRRIGATION LAYOUT SEE SHEET M-23

INSTRUMENT LEGEND:
1 - PRESSURE TRANSMITTER PIT-101 SEE DETAILS 1 M-30, 2 M-30
2 - TEMPERATURE TRANSMITTER TIT-113 SEE DETAIL 4 M-30
3 - TEMPERATURE ELEMENT TE-113 SEE DETAIL 3 M-30



Biofilter Pipe Perforation Detail 2 M-6

NO SCALE

PIPE PERFORATION SCHEDULE			
SECTION	NUMBER OF PIPE PERFORATIONS	CL TO CL DIMENSION	PERFORATION SIZE
1	40	5"	7/8"
2	22	4-1/2"	7/8"
3	135	3"	7/8"
4	140	2-1/2"	7/8"
WEEP HOLE	4	20'	7/8"

NOTE:
- THE FIRST WEEP HOLE SHALL BE 20' FROM THE END OF THE BIOFILTER MEDIA
- PERFORATIONS SHALL ALTERNATE ON EACH SIDE OF THE PIPE

MONTANA
John R. Gedak
NO. 12132PE
2/12/25
LICENSED PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Checked By: T.Williams, P.E.
Designed By: P.Montgomery, P.E.
Designed By: T.Pipher, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Jacobs
999 Main Street
STE. 1200
Boise, ID 83702
Phone (406) 212-4520

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Biofilter 1 Piping Details**

Sheet: **M-6**

CALLOUTS:

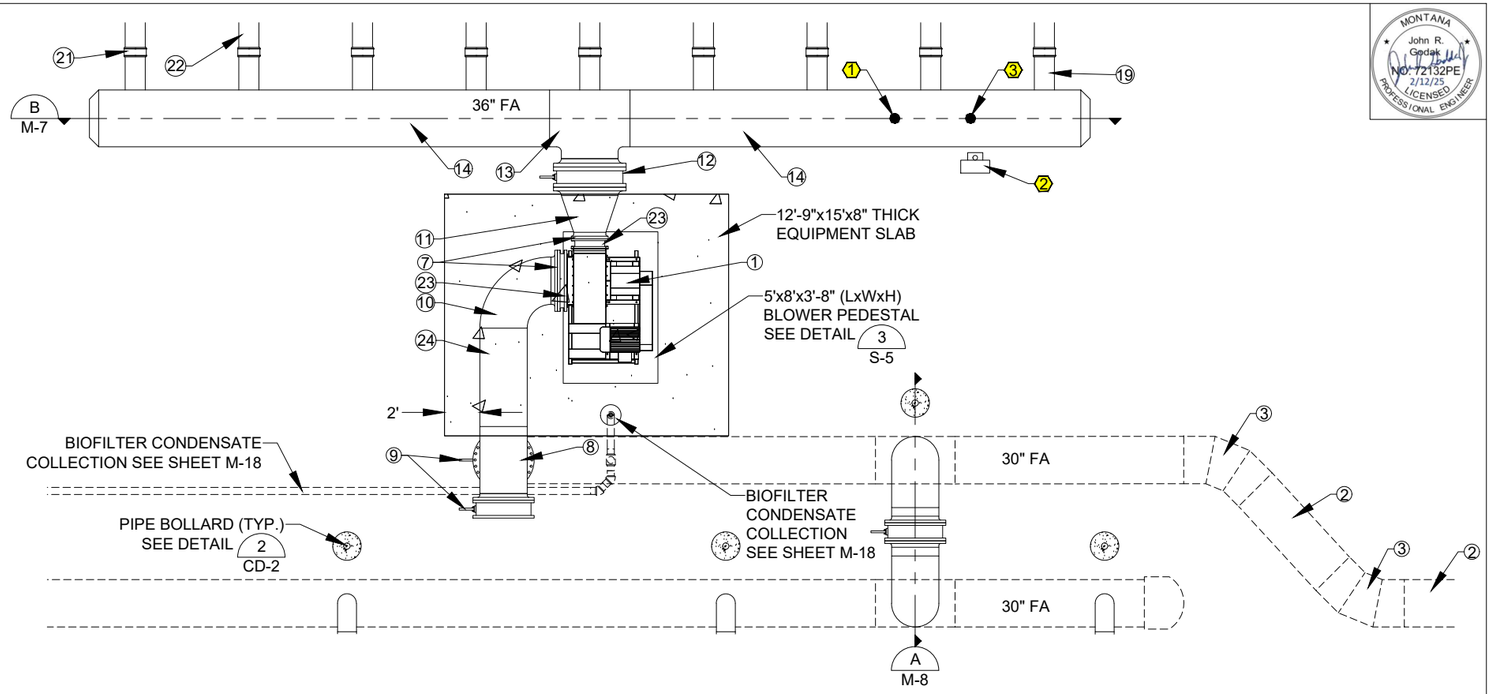
① - BIO-FAN-301: 50 HP BLOWER (NEW YORK BACKWARD INCLINED SWSI CLASS 4 SIZE 27 OR PRE-APPROVED EQUAL)
② - 30" HDPE SDR 26 PIPE SPOOL
③ - 30" HDPE SDR 26 BUTT FUSE 3 SEGMENT 45° BEND
④ - 30" HDPE SDR 26 BUTT FUSE 3 SEGMENT 90° BEND
⑤ - HDPE FLANGE (TYP.)
⑥ - 30" FLxFL FLEXIBLE CONNECTION
⑦ - FLxS.S. ADAPTER (TYP. ALL TRANSITIONS FROM S.S. TO FLANGE FITTINGS)
⑧ - 30" S.S. 12 GAUGE DUCT TEE
⑨ - 30" FLxFL GREENHECK HCDR-351 DAMPER
⑩ - 30" S.S. 12 GAUGE DUCT 90° BEND
⑪ - S.S 12 GAUGE DUCT RECTANGULAR TO 36" ROUND TRANSITION
⑫ - 36" FLxFL GREENHECK HCDR-351 DAMPER
⑬ - 36" S.S. 12 GAUGE DUCT TEE
⑭ - 36" S.S. 12 GAUGE DUCT FABRICATED HEADER WITH END CAPS AND 12" LATERAL CONNECTIONS
⑮ - 12" S.S. 16 GAUGE DUCT LATERAL
⑯ - 12" S.S. 16 GAUGE DUCT FIELD FIT
⑰ - 12" S.S. TO 12" HDPE SDR 17 ADAPTER
⑱ - 12" HDPE SDR 17 BUTT FUSE 90° BEND
⑲ - 12" HDPE SDR 17 PIPE FIELD FIT
⑳ - 4"x8"x16" STANDARD CMU BLOCK - RUN WORM GEAR PIPE CLAMPS THROUGH BLOCK AND SECURE AERATION LATERALS TO CMU BLOCK (TYP.)
㉑ - 12" FERNCO COUPLER (TYP.)
㉒ - 12" HDPE SDR 17 BIOFILTER AERATION LATERAL
㉓ - HOLZ FLEXIBLE JOINT STYLE 942 OR EQUAL
㉔ - 30" S.S. 12 GUAGE DUCT - FIELD FIT

INSTRUMENT LEGEND:

① - PRESSURE TRANSMITTER PIT-101 SEE DETAILS 1 M-30, 2 M-30
② - TEMPERATURE TRANSMITTER TIT-113 SEE DETAIL 4 M-30
③ - TEMPERATURE ELEMENT TE-113 SEE DETAIL 3 M-30

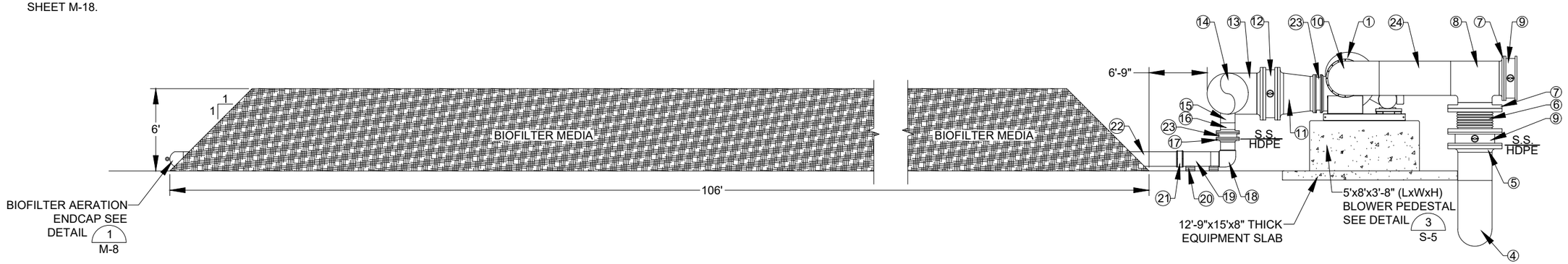
NOTES:

- 30" & 36" STAINLESS STEEL DUCT NOT OFF THE SHELF ITEMS. TYPICALLY REQUIRES FABRICATION.
- BIOFILTER MEDIA PILE LENGTH - 106'
- ALL FLANGE ADAPTERS SHALL UTILIZE AN IRON FLANGE.
- FOR FOUL AIR TO BIOFILTER CONDENSATE COLLECTION SEE SHEET M-18.



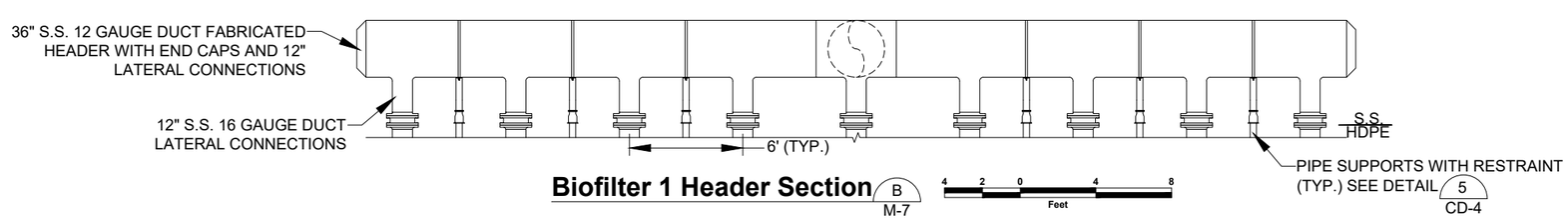
Biofilter 1 Piping Plan 1 M-6

4 2 0 4 8 Feet



Biofilter 1 Piping Section A M-6

4 2 0 4 8 Feet



Biofilter 1 Header Section B M-7

4 2 0 4 8 Feet

MONTANA John R. Gedak NO. 72132PE 2/12/25 LICENSED PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Checked By: T.Williams, P.E.
Designed By: P.Montgomery, P.E.
Designed By: T.Pipher, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

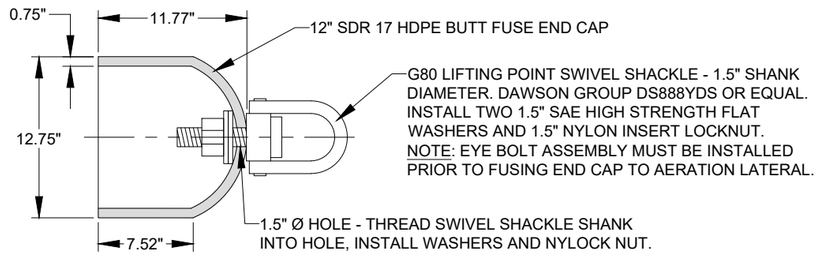
Jacobs
999 Main Street
STE. 1200
Boise, ID 83702
Phone (406) 212-4520

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

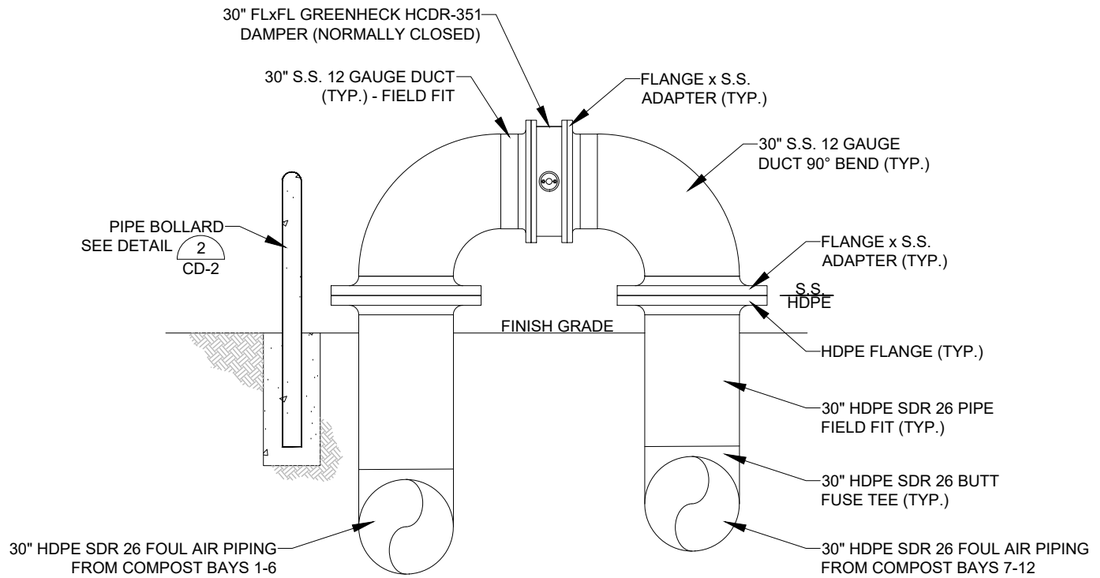
Sheet Title: **Biofilter 1 Piping Details**

Sheet: **M-7**



12" HDPE Biofilter Aeration Lateral End Cap Detail (1 / M-7,M-10)

NO SCALE



30" Foul Air Directional Damper Piping Section (A / M-7)

MONTANA
John R. Gedak
No. 72132PE
2/12/25
LICENSED PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Checked By: T.Williams, P.E.
Designed By: P.Montgomery, P.E.
Designed By: T.Pipher, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

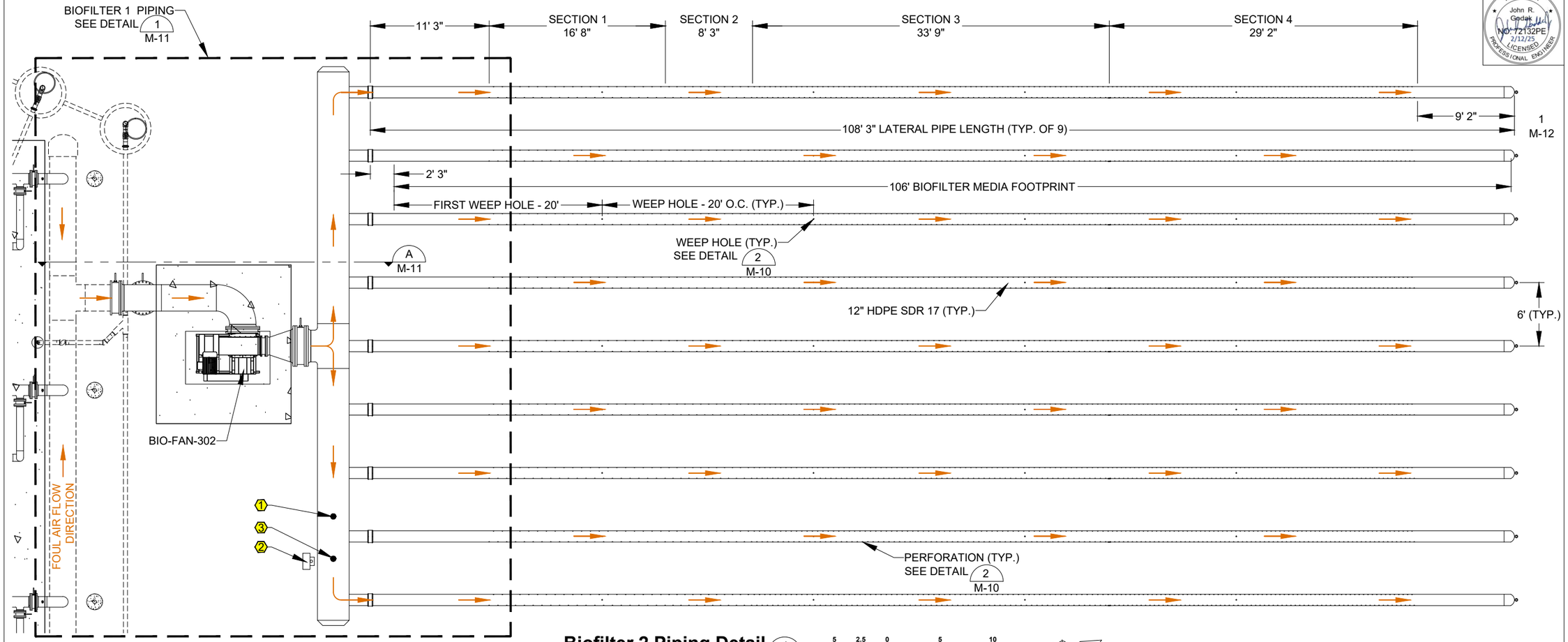
Jacobs
999 Main Street
STE. 1200
Boise, ID 83702
Phone (406) 212-4520

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Biofilter Details**

Sheet: **M-8**

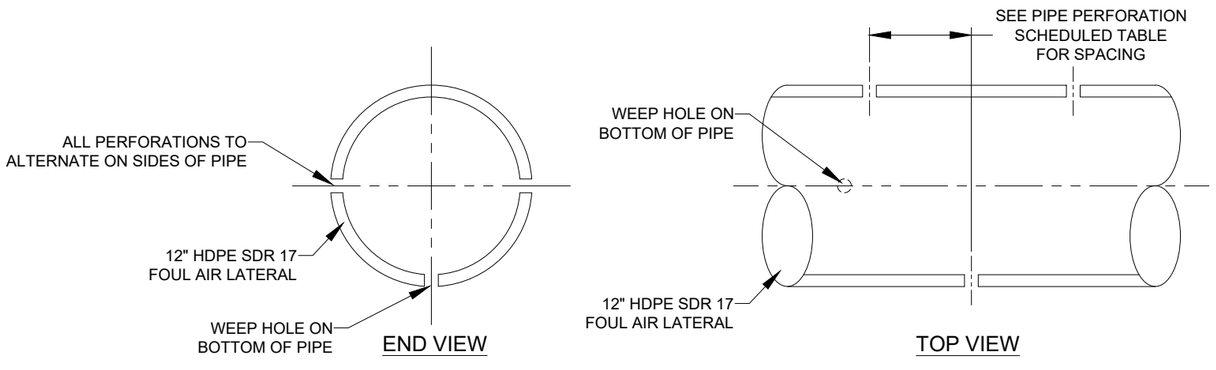


Biofilter 2 Piping Detail 1 M-5

5 2.5 0 5 10 Feet

NOTE:
FOR BIOFILTER IRRIGATION LAYOUT SEE SHEET M-23

INSTRUMENT LEGEND:
1 - PRESSURE TRANSMITTER PIT-102 SEE DETAILS 1 M-30, 2 M-30
2 - TEMPERATURE TRANSMITTER TIT-114 SEE DETAIL 4 M-30
3 - TEMPERATURE ELEMENT TE-114 SEE DETAIL 3 M-30



Biofilter Pipe Perforation Detail 2 M-10
NO SCALE

PIPE PERFORATION SCHEDULE			
SECTION	NUMBER OF PIPE PERFORATIONS	CL TO CL DIMENSION	PERFORATION SIZE
1	40	5"	7/8"
2	22	4-1/2"	7/8"
3	135	3"	7/8"
4	140	2-1/2"	7/8"
WEEP HOLE	4	20'	7/8"

NOTE:
- THE FIRST WEEP HOLE SHALL BE 20' FROM THE END OF THE BIOFILTER MEDIA
- PERFORATIONS SHALL ALTERNATE ON EACH SIDE OF THE PIPE

MONTANA
John R. Gedak
NO. 17132PE
2/12/25
LICENSED PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Checked By: T.Williams, P.E.
Designed By: P.Montgomery, P.E.
Designed By: T.Pipher, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Jacobs
999 Main Street
STE. 1200
Boise, ID 83702
Phone (406) 212-4520

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Biofilter 2 Piping Details**

Sheet: **M-10**

CALLOUTS:

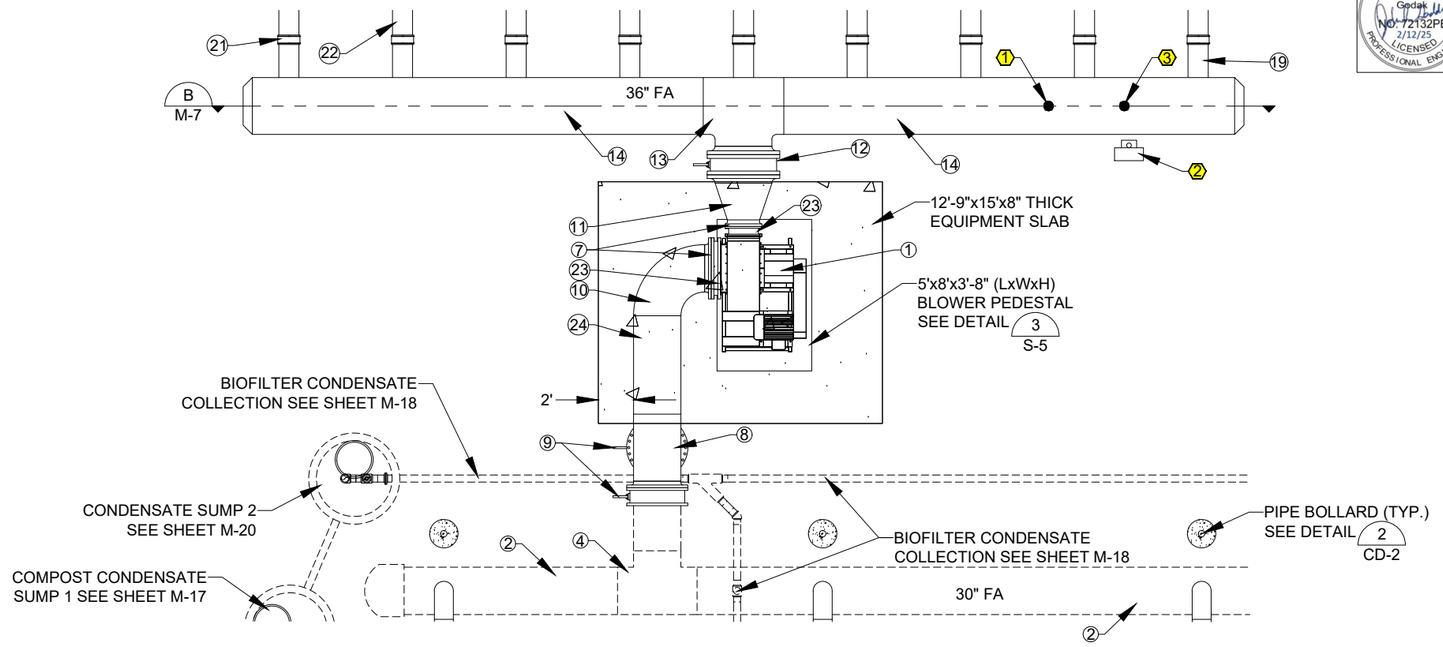
① - BIO-FAN-302: 50 HP BLOWER (NEW YORK BACKWARD INCLINED SWSI CLASS 4 SIZE 27 OR PRE-APPROVED EQUAL)
② - 30" HDPE SDR 26 PIPE SPOOL
③ - 30" HDPE SDR 26 BUTT FUSE 3 SEGMENT 45° BEND
④ - 30" HDPE SDR 26 BUTT FUSE TEE
⑤ - HDPE FLANGE (TYP.)
⑥ - 30" FLxFL FLEXIBLE CONNECTION
⑦ - FLxS.S. ADAPTER (TYP. ALL TRANSITIONS FROM S.S. TO FLANGE FITTINGS)
⑧ - 30" S.S. 12 GAUGE DUCT TEE
⑨ - 30" FLxFL GREENHECK HCDR-351 DAMPER
⑩ - 30" S.S. 12 GAUGE DUCT 90° BEND
⑪ - S.S 12 GAUGE DUCT RECTANGULAR TO 36" ROUND TRANSITION
⑫ - 36" FLxFL GREENHECK HCDR-351 DAMPER
⑬ - 36" S.S. 12 GAUGE DUCT TEE
⑭ - 36" S.S. 12 GAUGE DUCT FABRICATED HEADER WITH END CAPS AND 12" LATERAL CONNECTIONS
⑮ - 12" S.S. 16 GAUGE DUCT LATERAL
⑯ - 12" S.S. 16 GAUGE DUCT FIELD FIT
⑰ - 12" S.S. TO 12" HDPE SDR 17 ADAPTER
⑱ - 12" HDPE SDR 17 BUTT FUSE 90° BEND
⑲ - 12" HDPE SDR 17 PIPE FIELD FIT
⑳ - 4"x8"x16" STANDARD CMU BLOCK - RUN WORM GEAR PIPE CLAMPS THROUGH BLOCK AND SECURE AERATION LATERALS TO CMU BLOCK (TYP.)
㉑ - 12" FERNCO COUPLER (TYP.)
㉒ - 12" HDPE SDR 17 BIOFILTER AERATION LATERAL
㉓ - HOLZ FLEXIBLE JOINT STYLE 942 OR EQUAL
㉔ - 30" S.S. 12 GUAGE DUCT - FIELD FIT

INSTRUMENT LEGEND:

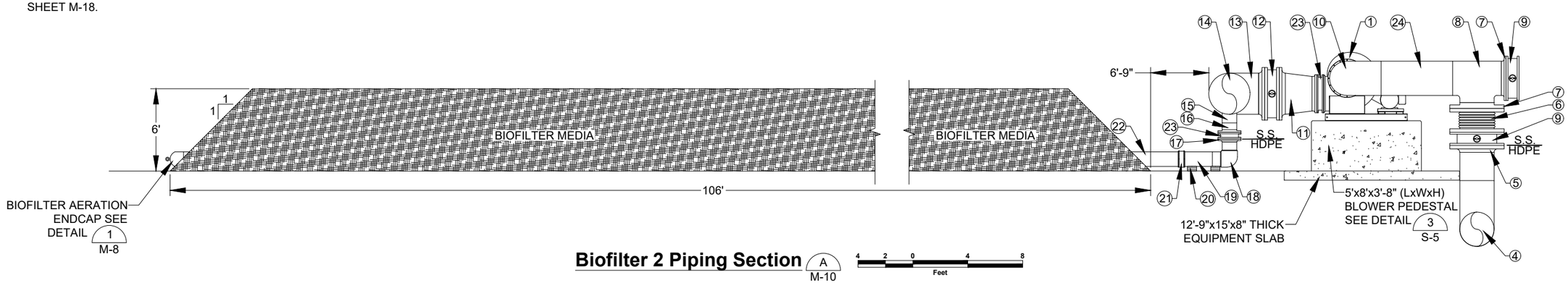
① - PRESSURE TRANSMITTER PIT-101 SEE DETAILS 1 M-30, 2 M-30
② - TEMPERATURE TRANSMITTER TIT-113 SEE DETAIL 4 M-30
③ - TEMPERATURE ELEMENT TE-113 SEE DETAIL 3 M-30

NOTES:

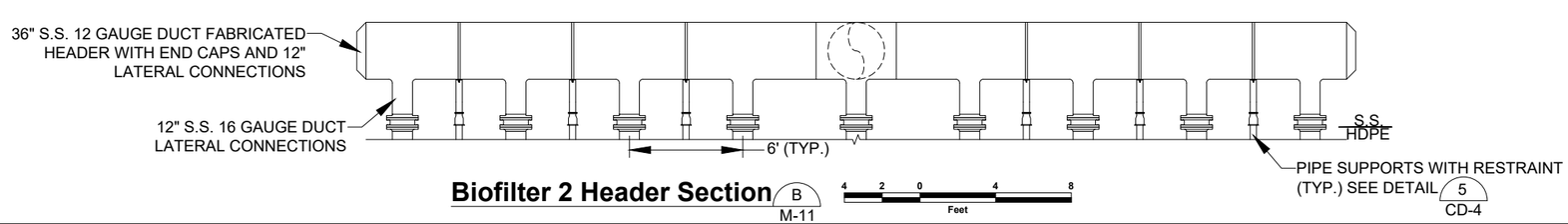
- 30" & 36" STAINLESS STEEL DUCT NOT OFF THE SHELF ITEMS. TYPICALLY REQUIRES FABRICATION.
- BIOFILTER MEDIA PILE LENGTH - 106'
- ALL FLANGE ADAPTERS SHALL UTILIZE AN IRON FLANGE.
- FOR FOUL AIR TO BIOFILTER CONDENSATE COLLECTION SEE SHEET M-18.



Biofilter 2 Piping Plan 1 M-10 — 4 2 0 4 8 Feet



Biofilter 2 Piping Section A M-10 — 4 2 0 4 8 Feet



Biofilter 2 Header Section B M-11 — 4 2 0 4 8 Feet

MONTANA John R. Gedak NO. 12132PE 2/12/25 LICENSED PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Checked By: T.Williams, P.E.
Designed By: P.Montgomery, P.E.
Designed By: T.Pipher, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

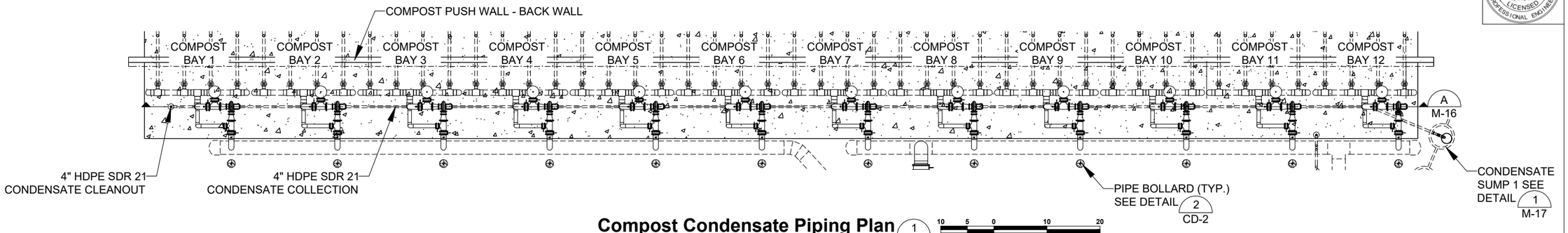
Jacobs
999 Main Street
STE. 1200
Boise, ID 83702
Phone (406) 212-4520

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Biofilter 2 Piping Details**

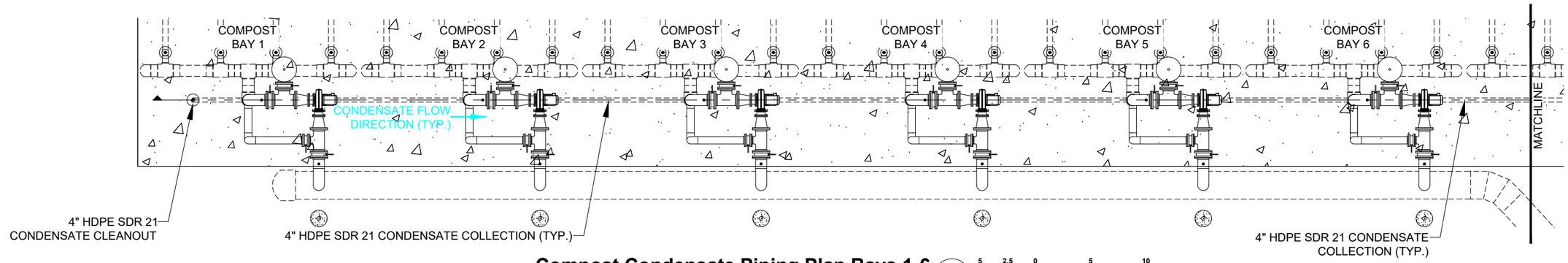
Sheet: **M-11**



Compost Condensate Piping Plan (1 / M-1)

10 5 0 10 20 Feet

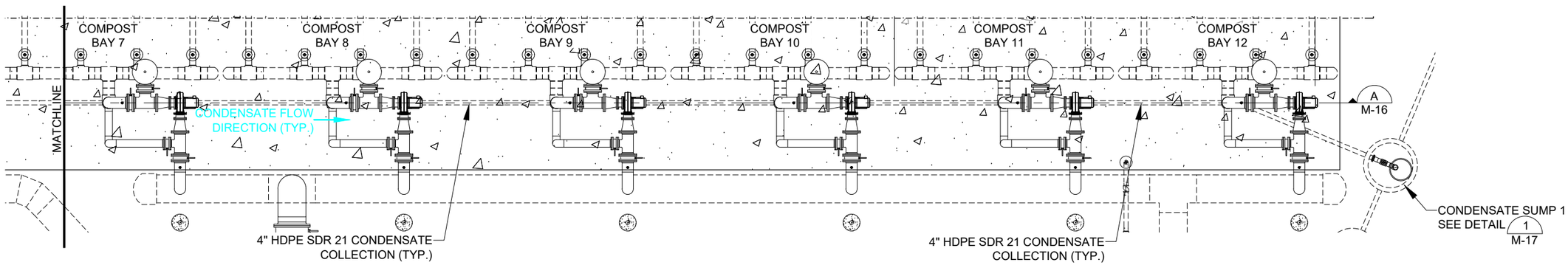
NOTES:
- SEE VIEWPORTS BELOW FOR MORE DETAILS



Compost Condensate Piping Plan Bays 1-6 (2 / M-1)

5 2.5 0 5 10 Feet

NOTE:
SECTION LINE CONTINUED THROUGH MATCHLINE.



Compost Condensate Piping Plan Bays 7-12 (3 / M-1)

5 2.5 0 5 10 Feet

NOTE:
SECTION LINE CONTINUED THROUGH MATCHLINE.

MONTANA
John R. Gedak
NO. 72132PE
2/12/25
LICENSED
PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Checked By: T.Williams, P.E.
Designed By: P.Montgomery, P.E.
Designed By: T.Pipher, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Jacobs
999 Main Street
STE. 1200
Boise, ID 83702
Phone (406) 212-4520

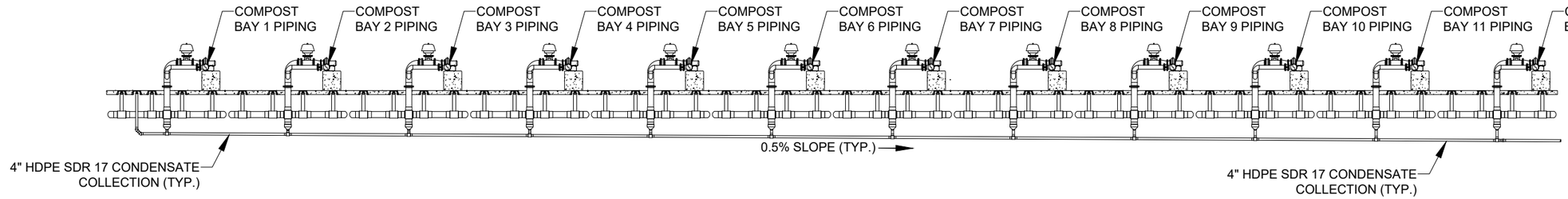
Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Compost Condensate Collection**

Sheet: **M-15**

X:\MISSOULA COMPOST\DESIGN\DRAWINGS RE-BID\Sheets\7 - Mechanical\M-15 Compost Condensate Collection.dwg SAVED:4/29/25 PRINTED:5/7/25 BY:ADAM

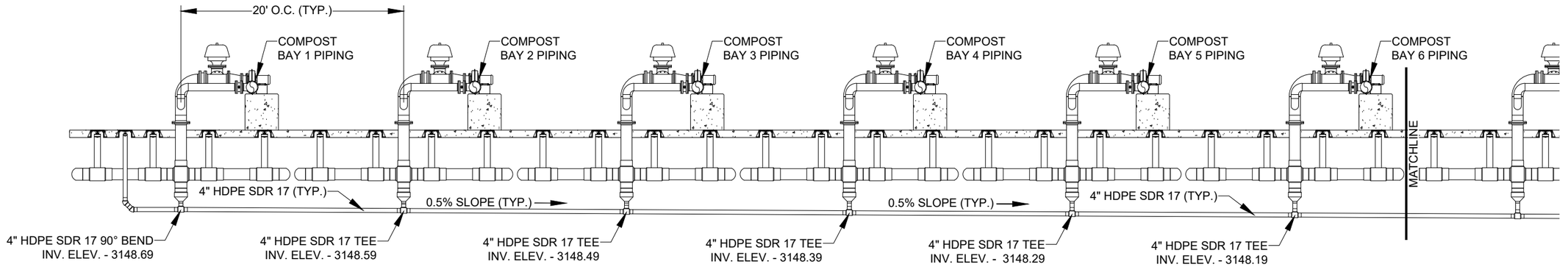


Compost Condensate Section

A M-15

10 5 0 10 20
Feet

NOTE:
SEE SECTIONS BELOW FOR MORE DETAILS

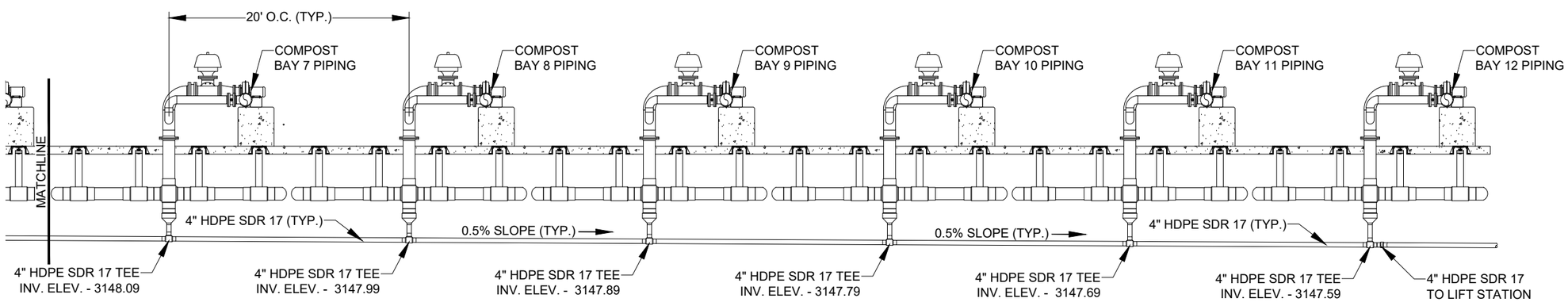


Compost Condensate Section Bays 1-6

A M-15

5 2.5 0 5 10
Feet

NOTE:
- SECTION CONTINUED THROUGH MATCHLINE.
- COMPOST CONDENSATE LINE AT 0.5% SLOPE



Compost Condensate Section Bays 7-12

A M-15

5 2.5 0 5 10
Feet

NOTE:
- SECTION CONTINUED THROUGH MATCHLINE.
- COMPOST CONDENSATE LINE AT 0.5% SLOPE

MONTANA
John R. Gedak
No. 72132PE
2/12/25
LICENSED PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Checked By: T.Williams, P.E.
Designed By: P.Montgomery, P.E.
Designed By: T.Pipher, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Jacobs
999 Main Street
STE. 1200
Boise, ID 83702
Phone (406) 212-4520

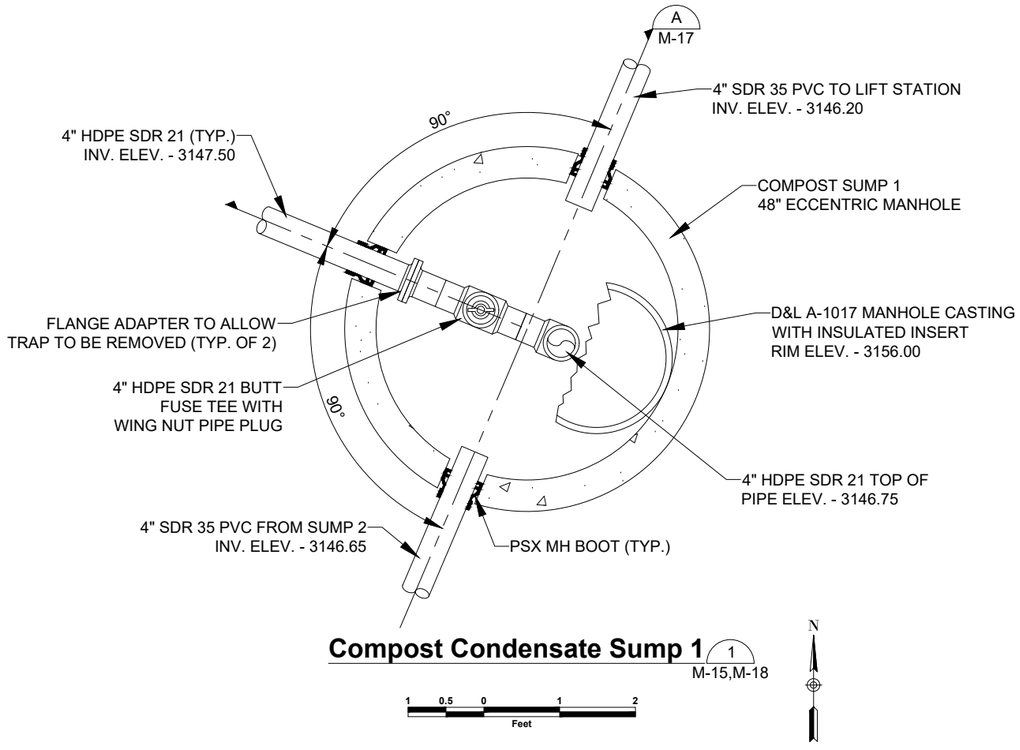
Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

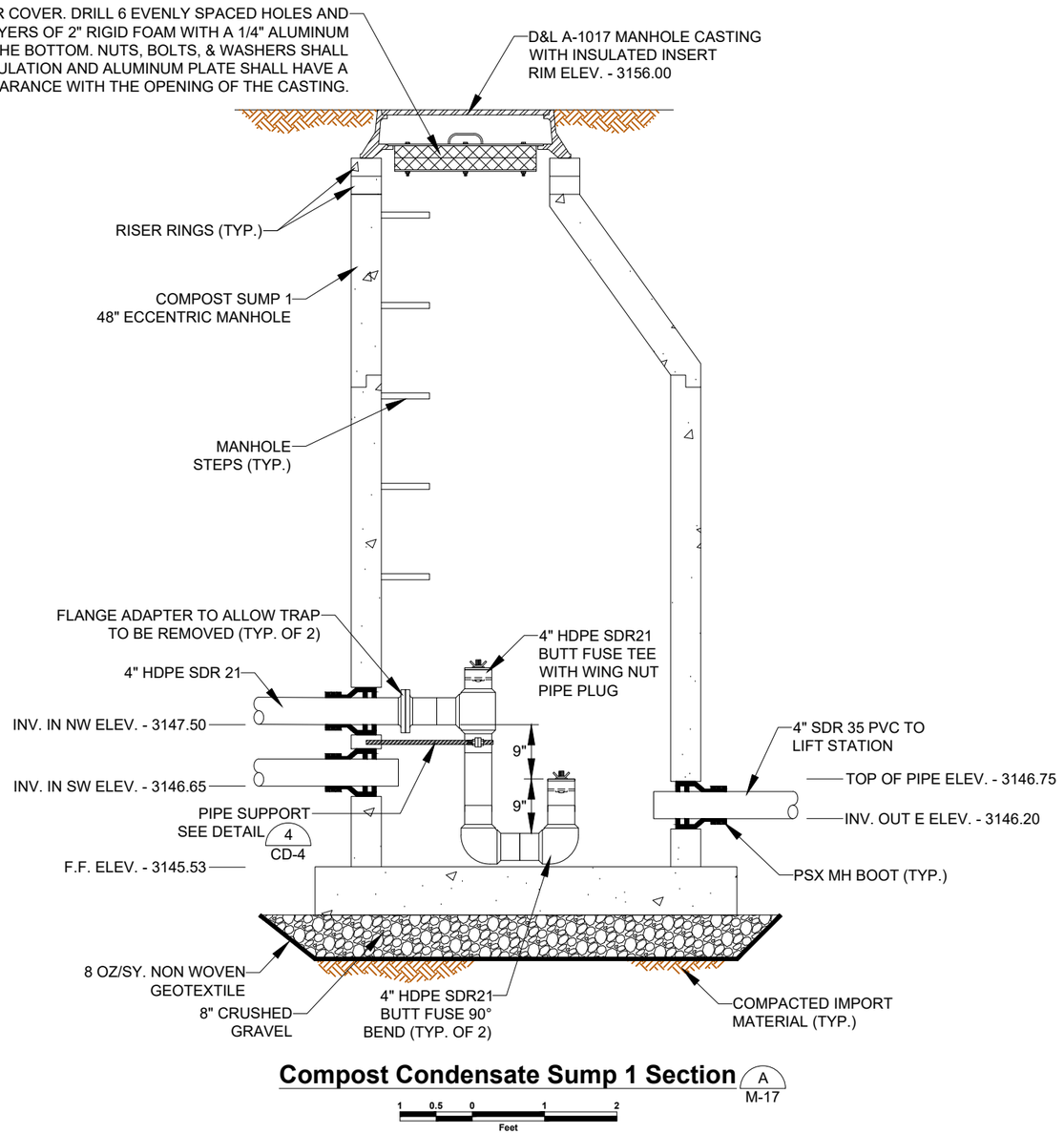
Sheet Title: **Compost Condensate Collection Section**

Sheet: **M-16**

X:\MISSOULA COMPOST\DESIGN\DRAWINGS RE-BID\Sheets\7 - Mechanical\M-16 Compost Condensate Collection Section.dwg SAVED:4/29/25 PRINTED:5/7/25 BY:ADAM



Compost Condensate Sump 1 (1 / M-15,M-18)



Compost Condensate Sump 1 Section (A / M-17)

NOTE:

- PIPE PENETRATIONS, CASTING, AND MANHOLE STEPS ROTATED FOR DRAWING CLARITY.
- ALL FLANGE ADAPTERS SHALL UTILIZE IRON FLANGES & STAINLESS STEEL BOLTS/NUTS.

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Checked By: T.Williams, P.E.
Designed By: P.Montgomery, P.E.
Designed By: T.Pipher, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

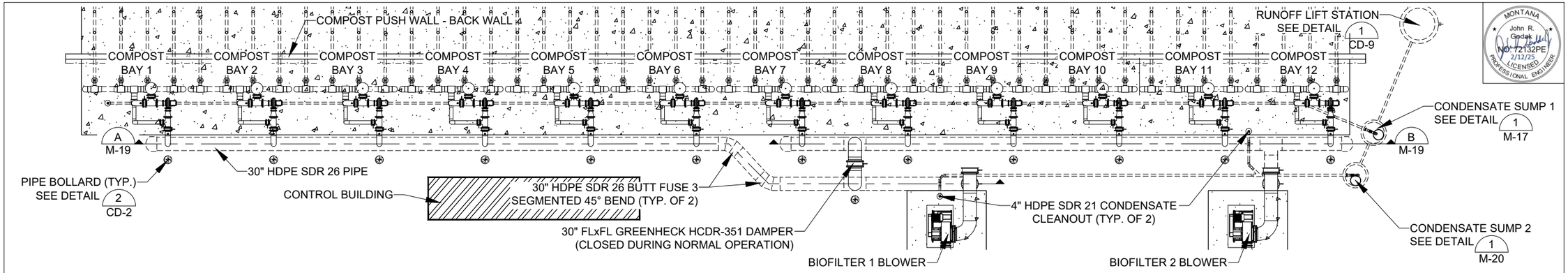
Jacobs
999 Main Street
STE. 1200
Boise, ID 83702
Phone (406) 212-4520

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Compost Condensate Sump 1 Details**

Sheet: **M-17**

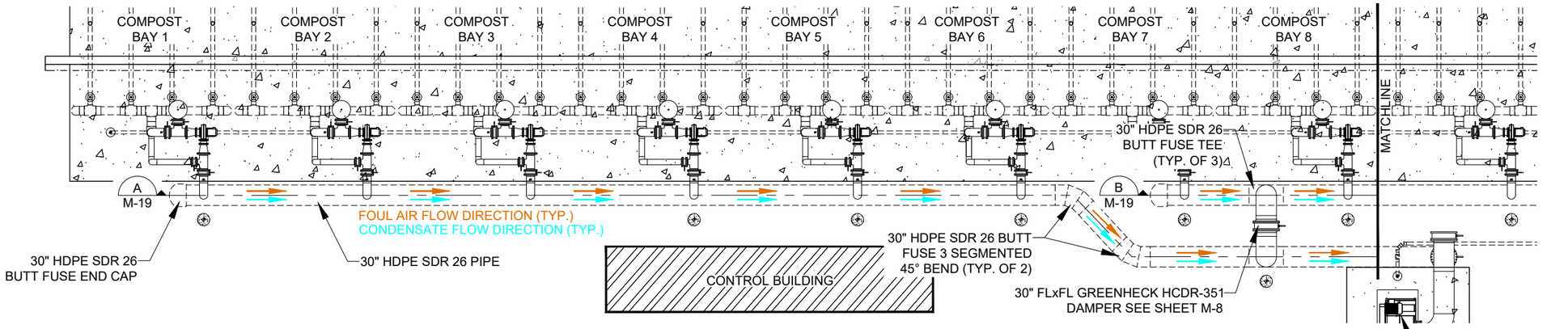


Foul Air to Biofilter Condensate Piping Plan

1 M-1

10 5 0 10 20 Feet

NOTES:
SEE VIEWPORTS BELOW FOR MORE DETAILS

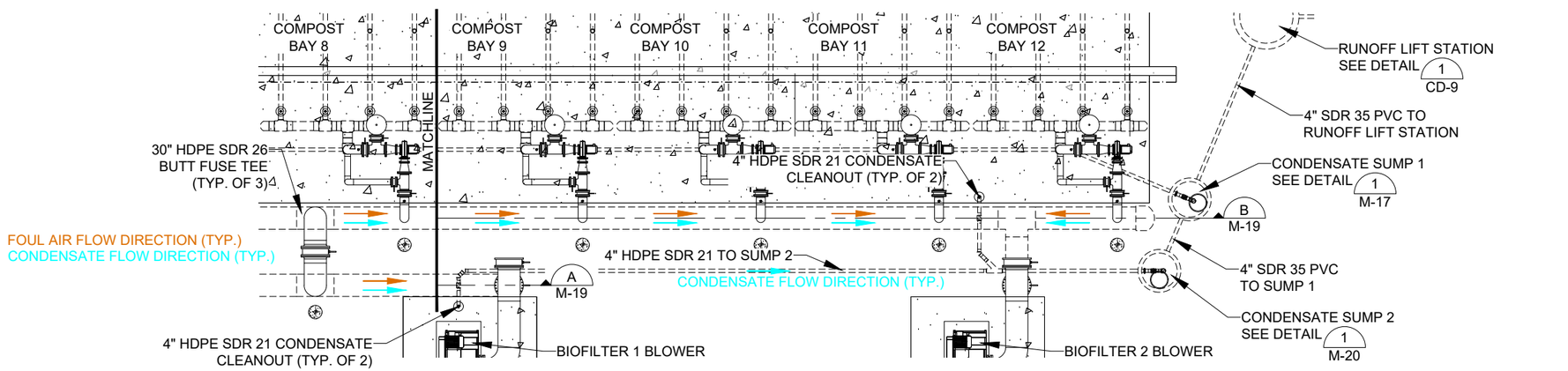


Foul Air to Biofilter Condensate Piping Plan Bays 1-8

2 M-1

7.5 3.75 0 7.5 15 Feet

NOTE:
SECTION LINE CONTINUED THROUGH MATCHLINE.



Foul Air to Biofilter Condensate Piping Plan Bays 9-12

3 M-1

7.5 3.75 0 7.5 15 Feet

NOTE:
SECTION LINE CONTINUED THROUGH MATCHLINE.

MONTANA
John R. Gedak
No. 72132PE
2/12/25
LICENSED PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Checked By: T.Williams, P.E.
Designed By: P.Montgomery, P.E.
Designed By: T.Pipher, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Jacobs
999 Main Street
STE. 1200
Boise, ID 83702
Phone (406) 212-4520

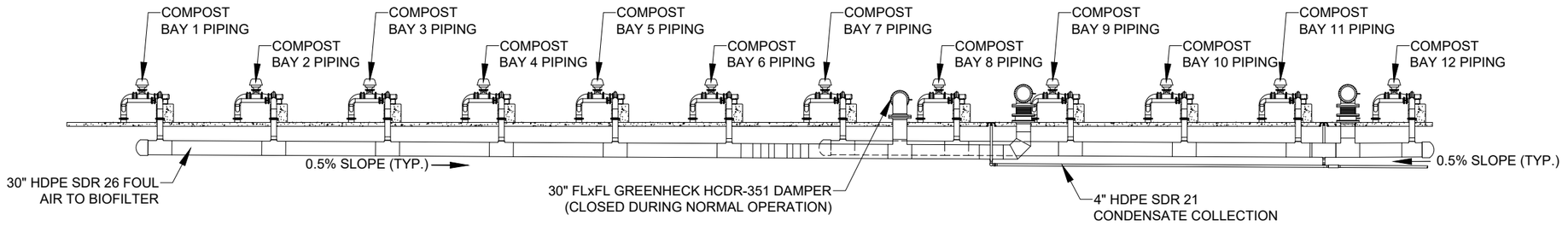
Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Foul Air to Biofilter Condensate Collection**

Sheet: **M-18**

X:\MISSOULA COMPOST\DESIGN\DRAWINGS RE-BID\Sheets\7 - Mechanical\M-18 Foul Air to Biofilter Condensate Collection.dwg SAVED:5/6/25 PRINTED:5/7/25 BY:ADAM

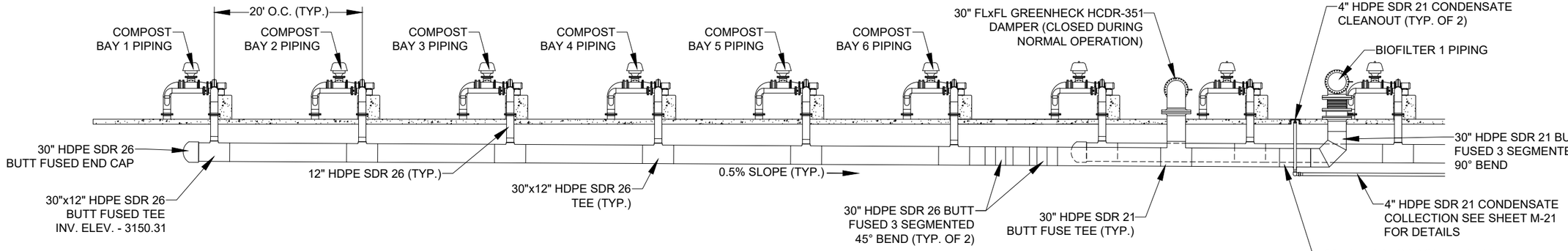


Foul Air to Biofilter Condensate Section

NO SCALE

A M-18 B M-18

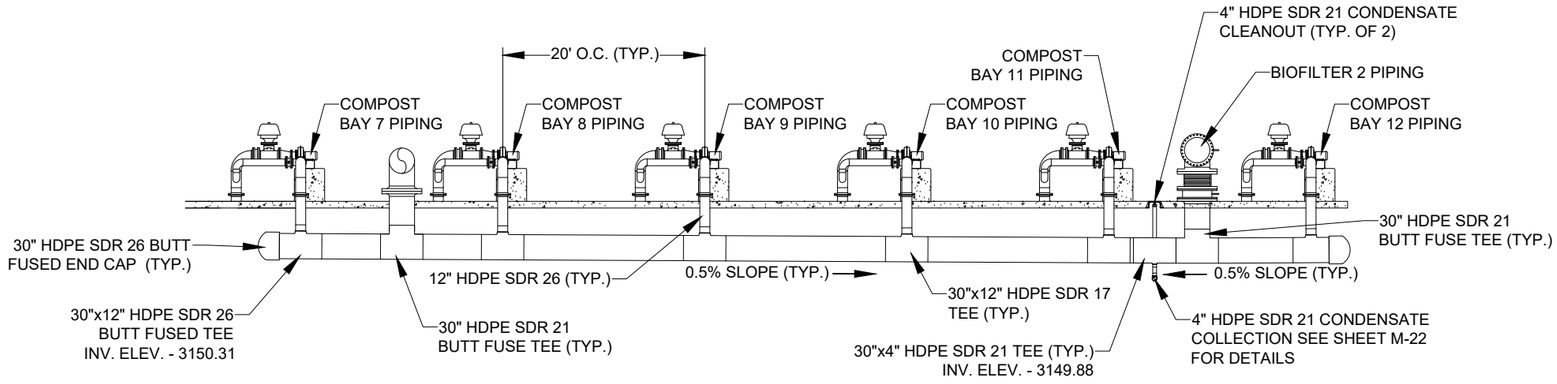
NOTES:
SEE VIEWPORTS BELOW FOR MORE DETAILS



Foul Air to Biofilter Condensate Section Bays 1-6

A M-18

7.5 3.75 0 7.5 15 Feet



Foul Air to Biofilter Condensate Section Bays 7-12

B M-18

7.5 3.75 0 7.5 15 Feet

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Checked By: T.Williams, P.E.
Designed By: P.Montgomery, P.E.
Designed By: T.Pipher, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

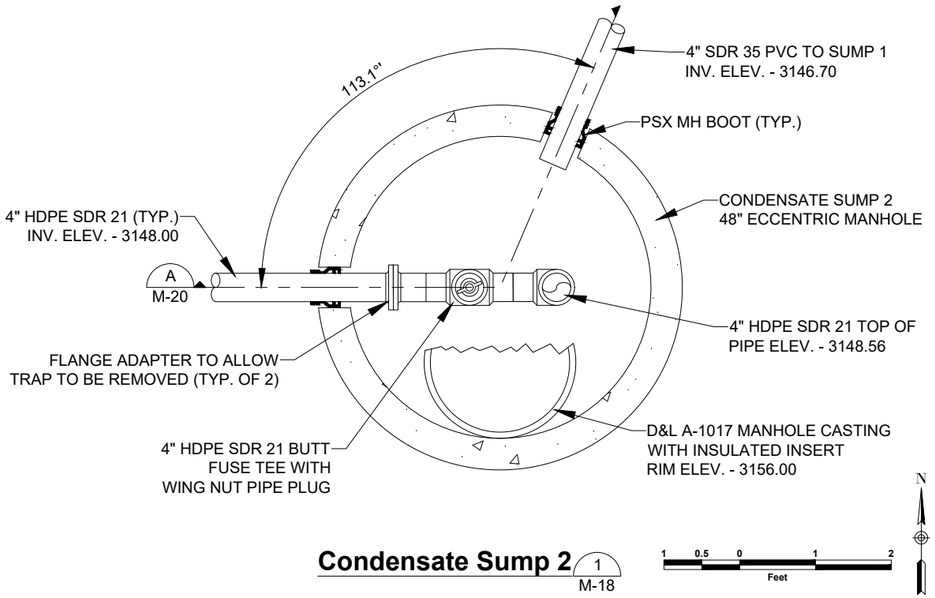
Jacobs
999 Main Street
STE. 1200
Boise, ID 83702
Phone (406) 212-4520

Owner: City Of Missoula

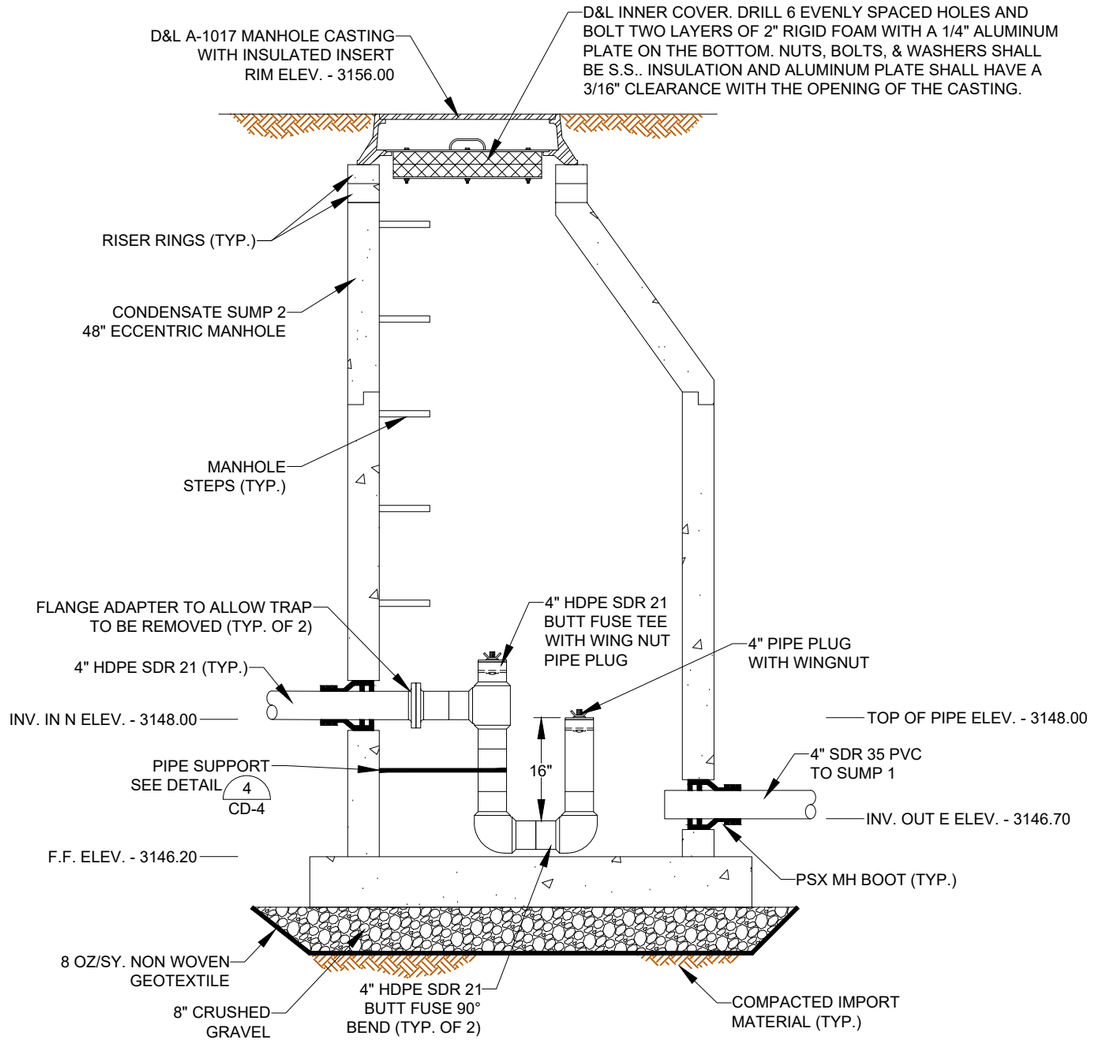
Project Title: Garden City Compost Facility Improvements

Sheet Title: **Foul Air to Biofilter Condensate Collection Section**

Sheet: **M-19**



Condensate Sump 2 (1 / M-18)



Condensate Sump 2 Section (A / M-20)

1 0.5 0 1 2
Feet

NOTE:
- PIPE PENETRATIONS, CASTING, AND MANHOLE STEPS ROTATED FOR DRAWING CLARITY.
- ALL FLANGE ADAPTERS SHALL UTILIZE IRON FLANGES & STAINLESS STEEL BOLTS/NUTS.

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Checked By: T.Williams, P.E.
Designed By: P.Montgomery, P.E.
Designed By: T.Pipher, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Jacobs
999 Main Street
STE. 1200
Boise, ID 83702
Phone (406) 212-4520

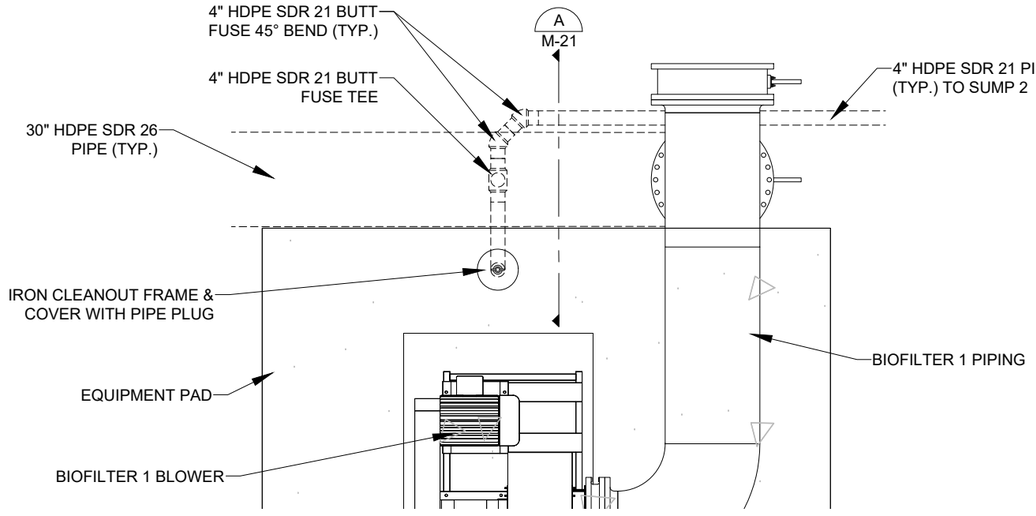
Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Condensate Sump 2 Details**

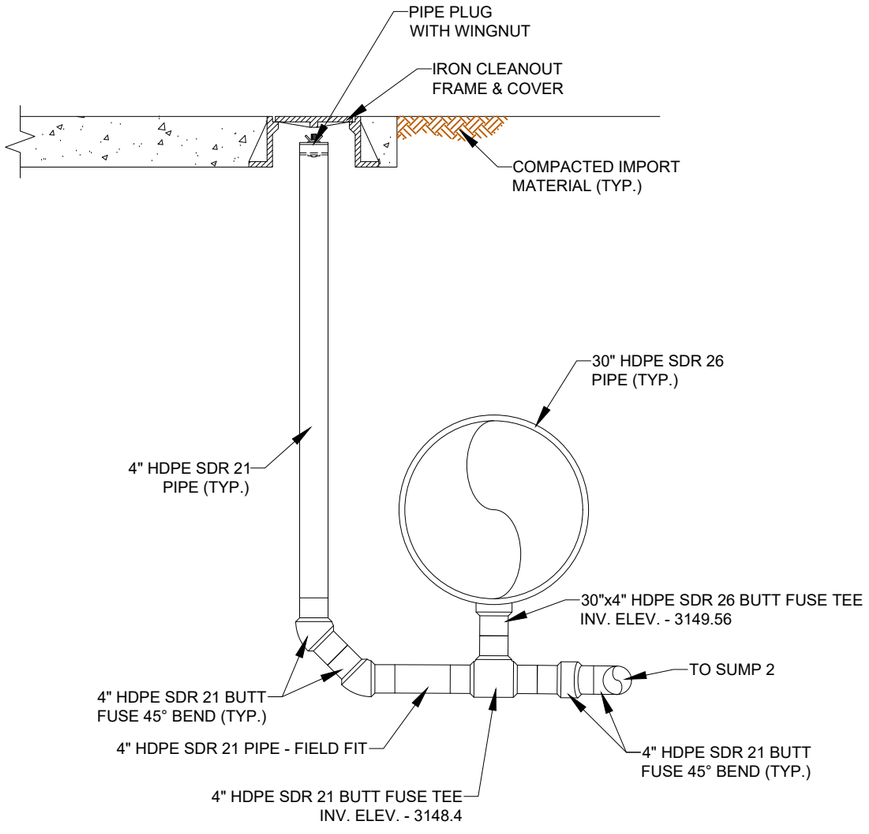
Sheet: **M-20**

X:\MISSOULA COMPOST\DESIGN\DRAWINGS RE-BID\Sheets\7 - Mechanical\M-20 Condensate Sump 2 Details.dwg SAVED: 4/25/25 PRINTED: 5/7/25 BY: ADAM



Biofilter 1 Condensate Cleanout Detail (1 / M-21)

2 1 0 2 4
Feet



Biofilter 1 Condensate Cleanout Section (A / M-21)

1 0.5 0 1 2
Feet

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Checked By: T.Williams, P.E.
Designed By: P.Montgomery, P.E.
Designed By: T.Pipher, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Jacobs
999 Main Street
STE. 1200
Boise, ID 83702
Phone (406) 212-4520

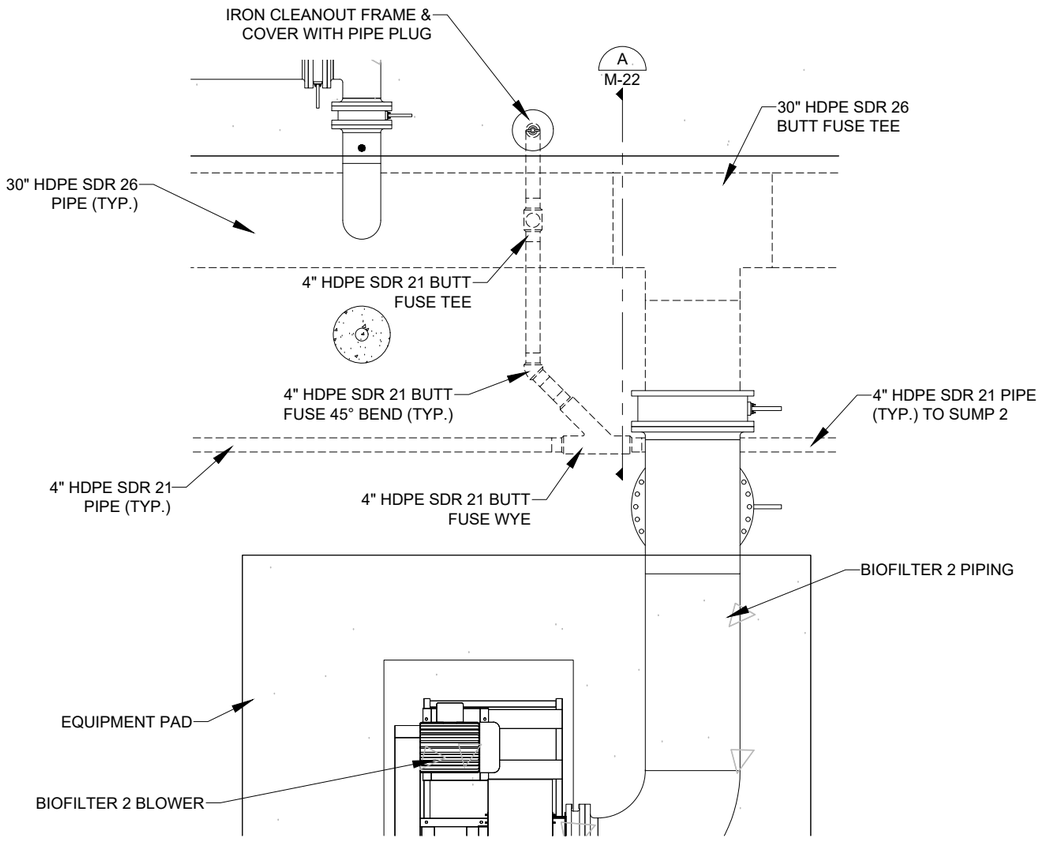
Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Biofilter 1 Condensate Cleanout Details**

Sheet: **M-21**

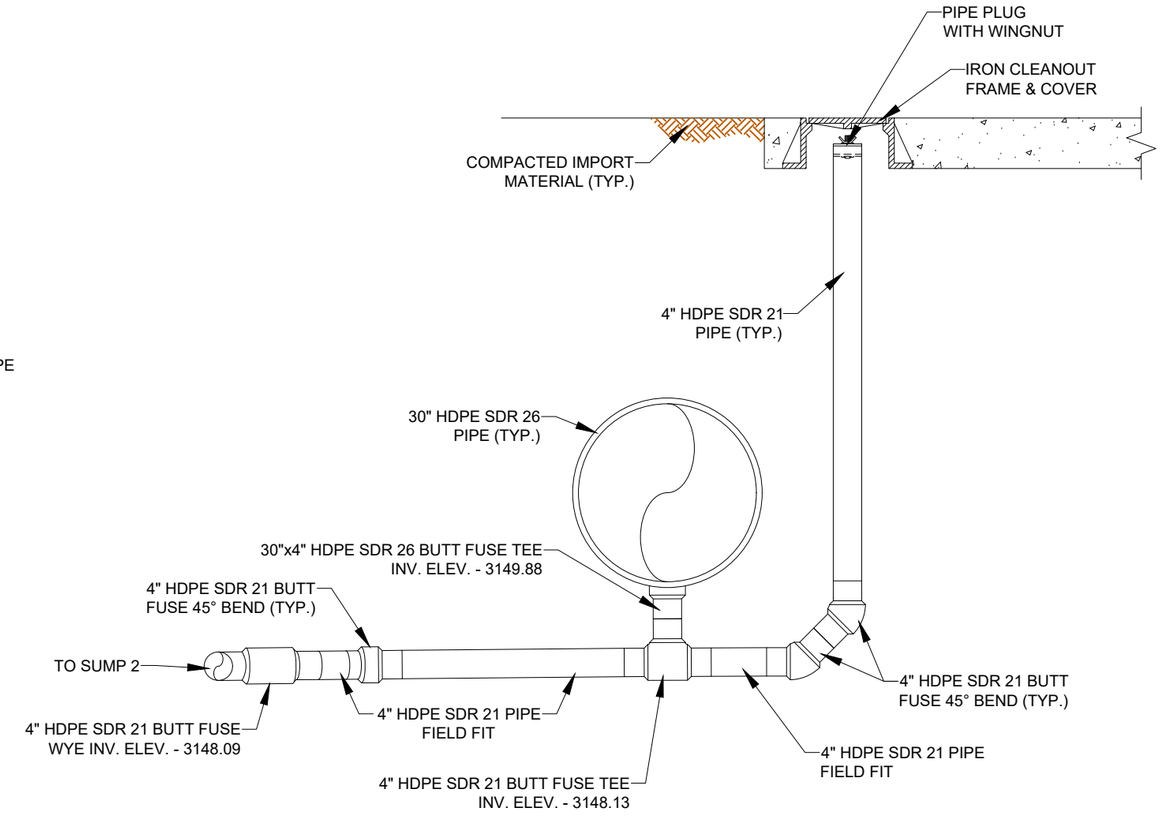
X:\MISSOULA COMPOST\DESIGN\DRAWINGS RE-BID\Sheets\7 - Mechanical\M-21 Biofilter 1 Condensate Cleanout Details.dwg SAVED:5/6/25 PRINTED:5/7/25 BY:ADAM



Biofilter 2 Condensate Cleanout Detail

1
M-22

2 1 0 2 4
Feet



Biofilter 2 Condensate Cleanout Section

A
M-22

1 0.5 0 1 2
Feet

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Checked By: T.Williams, P.E.
Designed By: P.Montgomery, P.E.
Designed By: T.Pipher, P.E.

Engineer
Anderson~Montgomery
CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

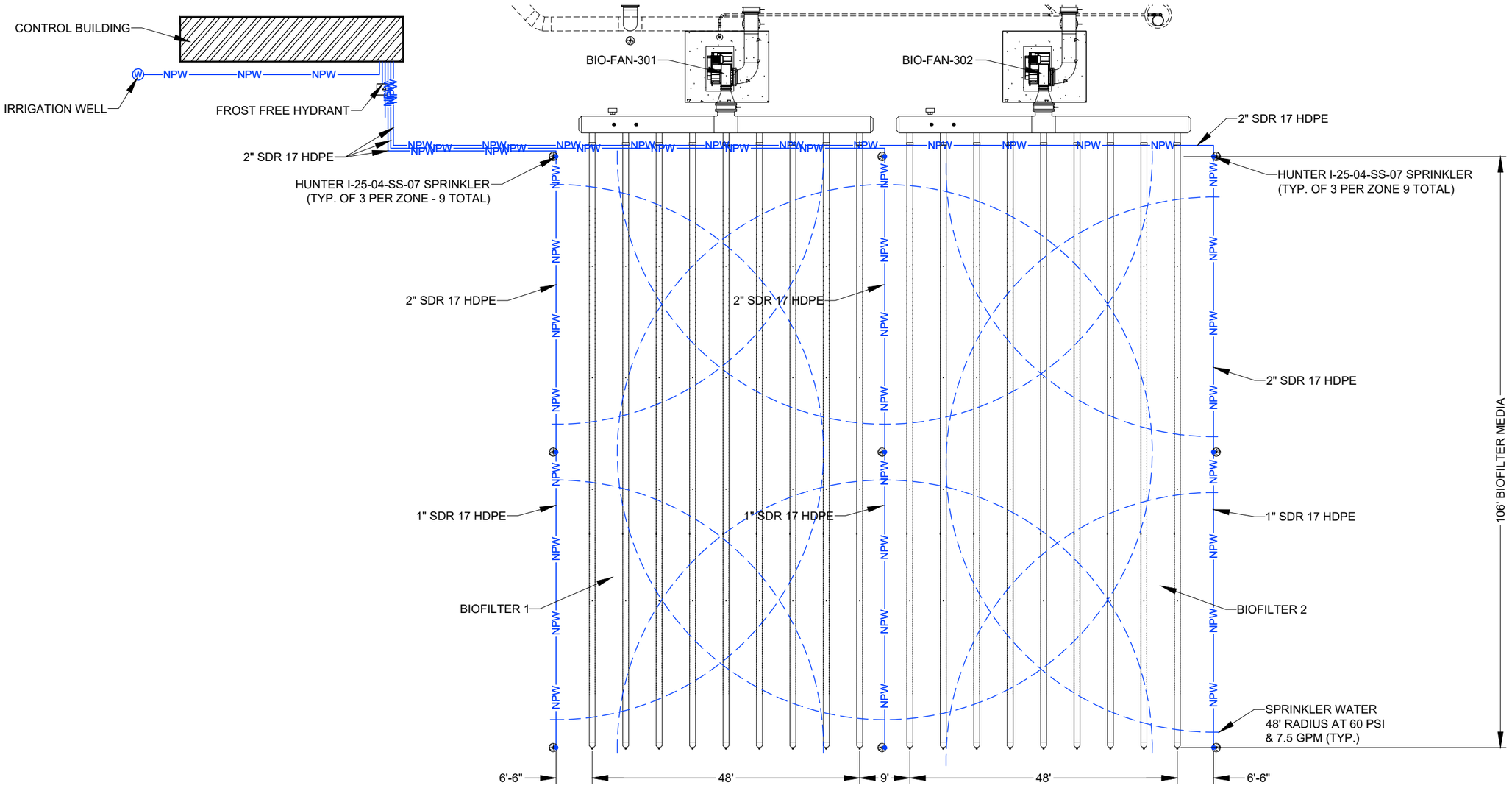
Jacobs
999 Main Street
STE. 1200
Boise, ID 83702
Phone (406) 212-4520

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Biofilter 2 Condensate Cleanout Details**

Sheet: **M-22**



Biofilter Bays Irrigation Plan

10 5 0 10 20
Feet

N

NOTES:

- ALL IRRIGATION PIPING SHALL HAVE A MINIMUM OF 18" OF COVER.
- IRRIGATION PIPING SHALL BE INSTALLED WITH FITTINGS AS SHOWN ON DRAWING OR INSTALLED WITH BENDS NOT EXCEEDING THE BEND RADIUS OF THE PIPE PER THE MANUFACTURER'S RECOMMENDATIONS.
- SPRINKLER ARC LENGTH SHOWN WITH NOZZLE #07 (ORANGE) AT 60 PSI WITH A 48' RADIUS AND 7.5 GPM.
- FOR SPRINKLER MOUNTING SEE DETAIL 2 / M-29

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Checked By: T.Williams, P.E.
Designed By: P.Montgomery, P.E.
Designed By: T.Pipher, P.E.

Engineer
Anderson~Montgomery
CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

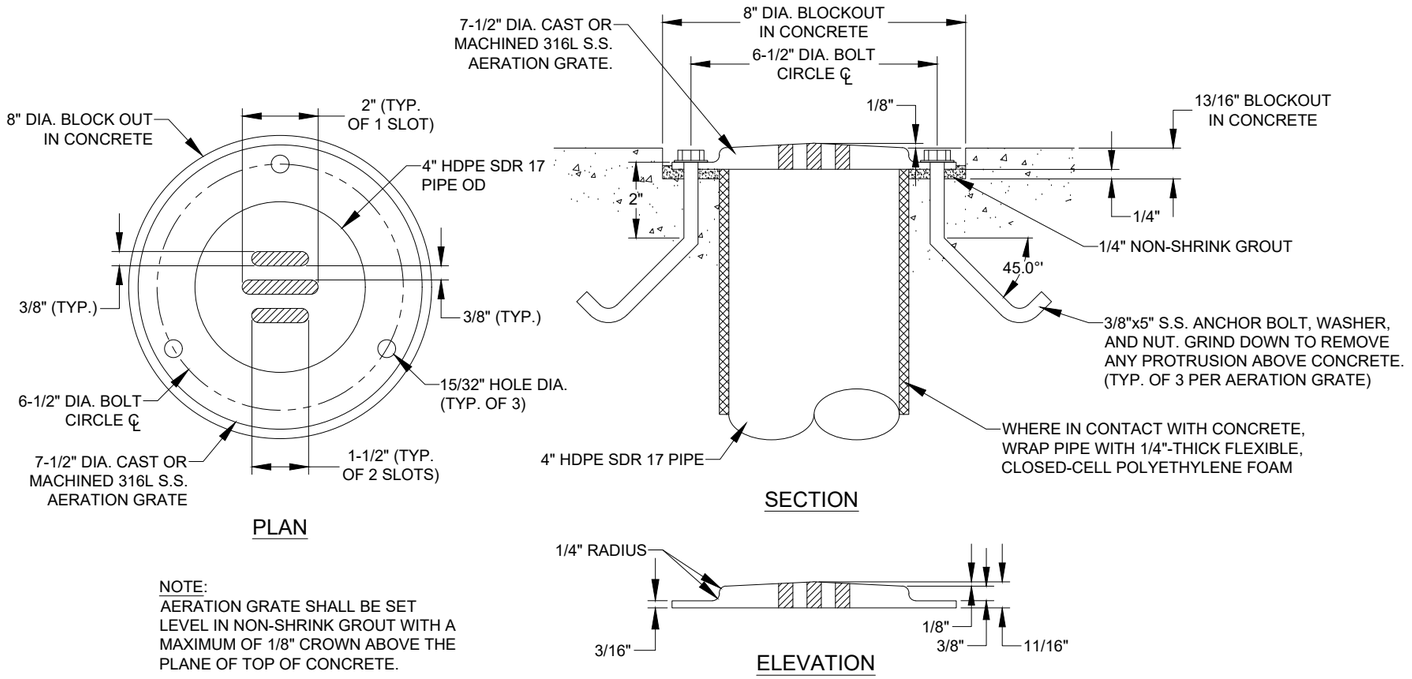
Jacobs
999 Main Street
STE. 1200
Boise, ID 83702
Phone (406) 212-4520

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Biofilter Bays Irrigation**

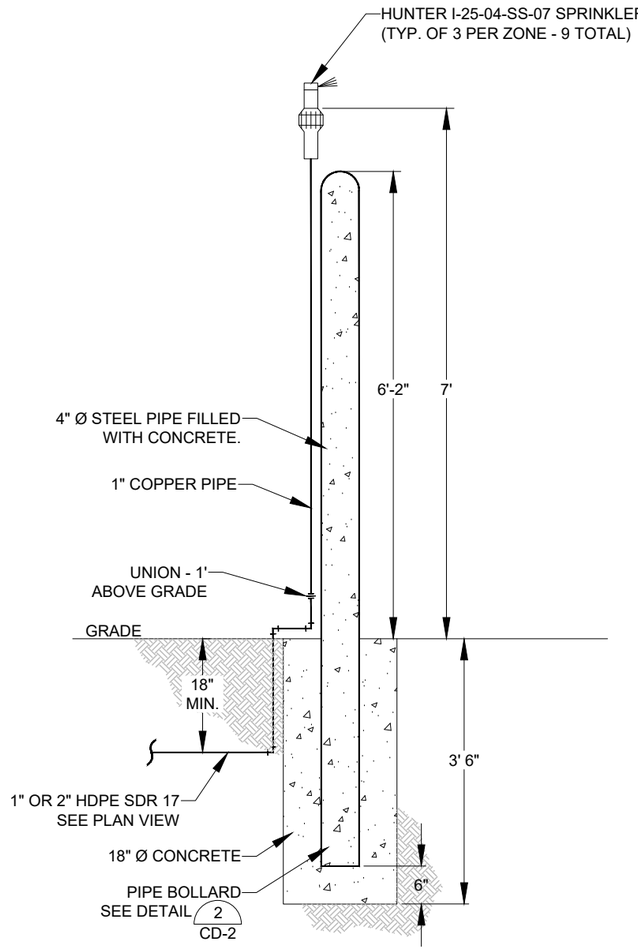
Sheet: **M-23**



NOTE:
AERATION GRATE SHALL BE SET LEVEL IN NON-SHRINK GROUT WITH A MAXIMUM OF 1/8" CROWN ABOVE THE PLANE OF TOP OF CONCRETE.

Compost In-Floor Grate Detail (1 / M-2)

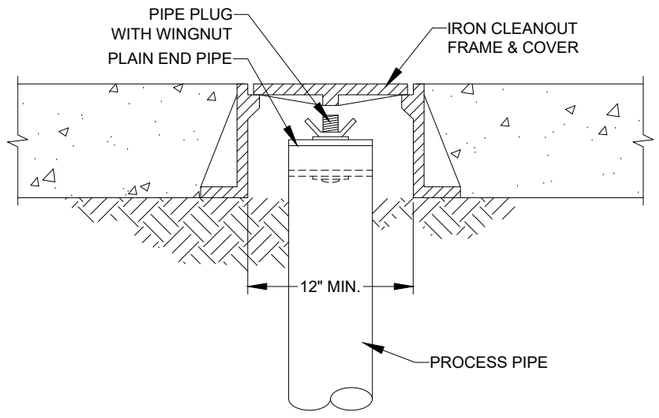
NO SCALE



Biofilter Irrigation Sprinkler Anchoring (2 / M-23)

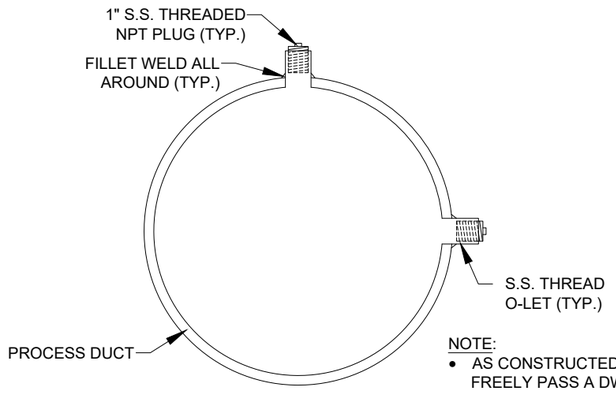
NO SCALE

NOTES:
- IRRIGATION PIPING SHALL HAVE A MINIMUM OF 18" BURIAL DEPTH.
- USE S.S. PIPE STRAPS TO SECURE COPPER PIPE TO BOLLARD. S.S. SPACERS MAY BE REQUIRED TO SUPPORT PIPING. MINIMUM OF 3 STRAPS PER BOLLARD.
- SPRINKLER HEADS SHALL BE EQUIPPED WITH NOZZLE #07 (ORANGE) WITH SPECIFCATIONS OF 60 PSI WITH A 48' RADIUS AND 7.5 GPM.
- OWNER SHALL BE SUPPLIED WITH 2 SPARE SETS OF NOZZLES.
- IRRIGATION PIPE BOLLARDS ARE TALLER THAN THE STANDARD DETAIL BOLLARD SHOWN ON SHEET CD-2. ALL OTHER BOLLARD STANDARDS ARE THE SAME.



Slab On-Grade Clean Out (3 / ~)

NO SCALE



NOTE:
- AS CONSTRUCTED EACH PORT MUST BE able TO FREELY PASS A DWYER SERIES 160 PITOT TUBE.

Foul Air Test Port Tap (4 / ~)

NO SCALE

MONTANA
John R. Gedak
NO. 17132PE
2/12/25
LICENSED PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Checked By: T.Williams, P.E.
Designed By: P.Montgomery, P.E.
Designed By: T.Pipher, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Jacobs
999 Main Street
STE. 1200
Boise, ID 83702
Phone (406) 212-4520

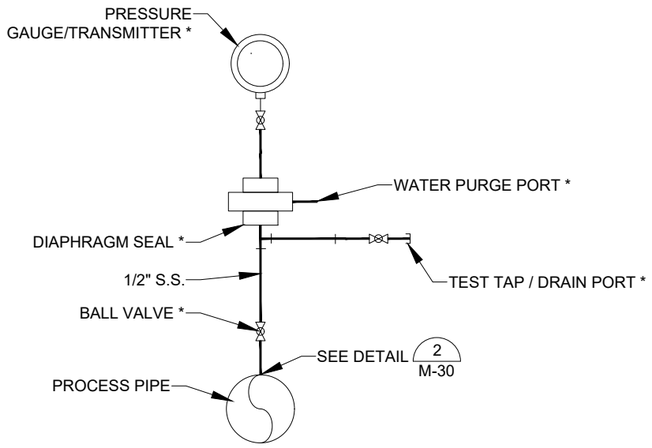
Owner
City Of Missoula

Project Title
Garden City Compost Facility Improvements

Sheet Title
Details

Sheet
M-29

X:\MISSOULA COMPOST\DESIGN\DRAWINGS RE-BID\Sheets\7 - Mechanical\M-29 Details.dwg SAVED:5/2/25 PRINTED:5/7/25 BY:ADAM

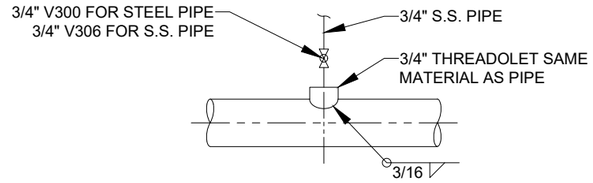


Pressure Instrument Installation - Diaphragm Seal (1)

NO SCALE

NOTES:

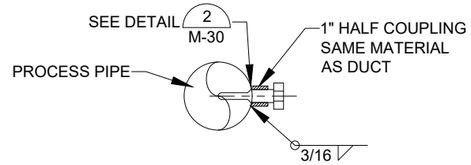
- COMPONENTS DESIGNATED WITH AN * ARE SUPPLIED BY THE INSTRUMENT MANUFACTURER.
- ADD THERMAL INSULATION FOR OUTDOOR INSTRUMENTS



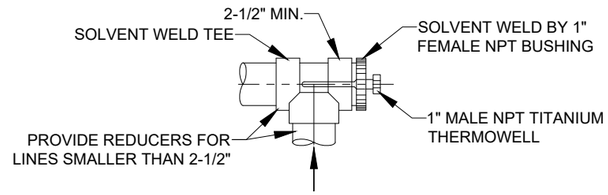
STEEL & S.S. DUCT 4" & LARGER

Pressure Connection Installation (2)

NO SCALE



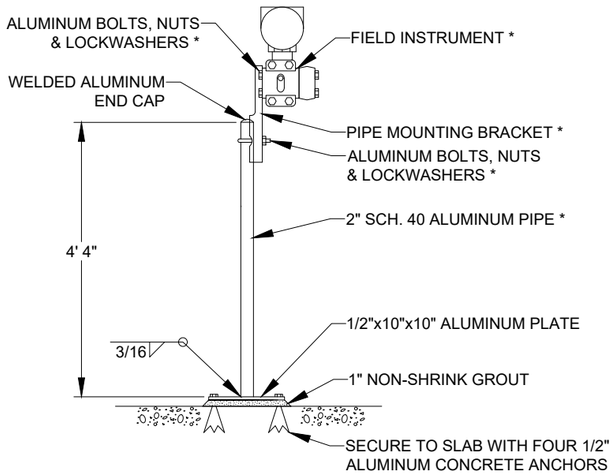
DUCT



PVC & CPVC PIPE

Thermowell Installation (3)

NO SCALE



STANCHION MOUNT

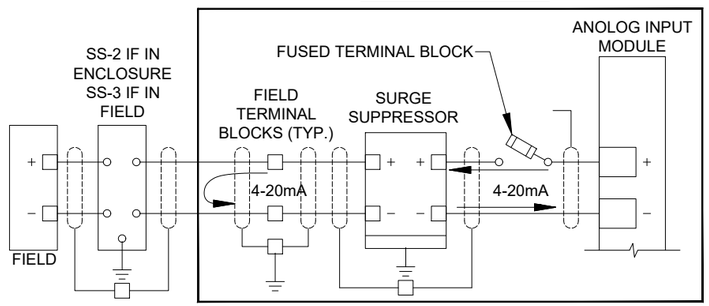
Field Instrument Mounting - Stanchion (4)

NO SCALE

NOTES:

- COMPONENTS DESIGNATED WITH AN * ARE SUPPLIED BY THE INSTRUMENT MANUFACTURER.
- PAINT ALUMINUM IN CONTACT WITH CONCRETE ACCORDING TO SPECIFICATIONS FOR PAINTING.

TYPICAL ANALOG INPUT



Type "SS-2" Surge Suppressor Wiring Diagram (5)

NO SCALE

MONTANA
John R. Gedak
NO. 72132PE
2/12/25
LICENSED PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A.Eckhart, P.E.
Approved By: P.Montgomery, P.E.
Checked By: A.Eckhart, P.E.
Checked By: T.Williams, P.E.
Designed By: P.Montgomery, P.E.
Designed By: T.Pipher, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Jacobs
999 Main Street
STE. 1200
Boise, ID 83702
Phone (406) 212-4520

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Instrument Details**

Sheet: **M-30**

ABBREVIATIONS:

ACI	American Concrete Institute
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
ASTM	ASTM International
ASD	Allowable stress design
AWS	American Welding Society
CRSI	Concrete Reinforcing Steel Institute
ICC	International Code Council
PCA	Portland Cement Association
WRI	Wire Reinforcement Institute
(E)	Existing
(N)	New
f'_c	Specified compressive strength of concrete, psi
f_y	Minimum specified yield strength of reinforcing steel, psi
psf	Pounds per square foot used for loads on building or reactions as from soil on footings
psi	Pounds per square inch used for stress or strength of concrete and reinforcing bars
kip	1000 pounds
ksi	Kips per square inch
C	American Standard Channels
HP	Bearing pile shapes
HSS	Hollow structural sections
L	Angles
M	Miscellaneous shapes
MC	Miscellaneous channels
MT	Structural tees from M-shapes
S	American Standard Beams
ST	Structural tees from S-shapes
TS	Structural tubing
W	Wide-flange shapes
WT	Structural tees from W-shapes
ADD'L	Additional
B, BOT	Bottom
BO, BOF	Bottom of, bottom of footing
CB	Catch basin, corner bar
CIP	Cast-in-place
CJ	Control joint
CL, CLR	Clear
CONC	Concrete
CONST	Construction
CONT	Continuous
CONTR JT	Contraction joint
CTR, CTRD	Center, centered
CY	Cubic yard
DIA	Diameter
DWG	Drawing
DWL	Dowel
EA	Each
EE	Each end
EF	Each face
EJ, EXP JT	Expansion joint
EL, ELEV	Elevation
EOR	Engineer on record
EQ	Equal
E.S.	Each side
EW	Each way
EXIST	Existing
EXP	Expansion
EXT	Extend, exterior
FDN, FNDN	Foundation
FIN	Finish
FT	Feet, foot
FTG	Footing
GALV	Galvanized
GC	General contractor
GR	Grade
H, HOR, HORIZ, HZ	Horizontal
ID	Inside diameter
IF	Inside face
IN	Inch, inches
JT	Joint
KIP	Thousand pounds
LB	Pound
LD	Development length of reinf. bar
LF	Linear feet
LIN	Linear
LONGIT	Longitudinal
MAX	Maximum
MIN	Minimum
MFR	Manufacturer
NIC	Not in contract
NO	Number
NOM	Nominal
NTS	Not to scale
OC	On center
OD	Outside diameter
OF	Outside face
OH	Opposite hand, overhang
OPNG	Opening
OPP	Opposite
PC	Precast
PCS	Pieces
PL	Plane bar, plate
PLCS	Places
PROJ	Project
P.A.	Preservative treated
PVMT	Pavement
QTY	Quantity
RC	Reinforced concrete
RD	Round
REBAR	Deformed reinforcing bar
REINF	Reinforcement
REQ	Require
REV	Revision
SC	Shotcrete
SCD	See civil drawings
SCHED	Schedule
SE	Slab edge
SECT	Section
SF	Square feet, square footage
SIM	Similar
SM	Sheet metal
SMD	See mechanical drawings
SOG	Slab on ground
SPA	Space
SPCG	Spacing
SQ	Square
STD	Standard
STRUCT	Structural, structures
T	Top
TC, TOC	Top of concrete
TF, TOF	Top of footing
TO	Top of
TOP	Top of precast, top of pier
TOS	Top of slab, top of steel
TOW, TW	Top of wall
TRANSV	Transverse
TYP	Typical
UNO, UON	Unless noted otherwise
USO, UOS	Unless shown otherwise
V, VERT, VT	Vertical
VIF	Verify in field
WWF	Welded wire fabric
X-SECT	Cross section

00.00 - GENERAL:

1. WHERE THERE IS A CONFLICT BETWEEN THESE GENERAL STRUCTURAL NOTES AND A SPECIFIC REQUIREMENT IN THE PLANS AND DETAILS, THE SPECIFIC REQUIREMENT SHALL BE APPLICABLE. WHERE, IN ANY SPECIFIC CASE, DIFFERENT PORTIONS OF THESE DRAWINGS SPECIFY DIFFERENT MATERIALS, METHODS OF CONSTRUCTION OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE SHALL GOVERN.
2. PROVISIONS OF A PROJECT MANUAL (SPECIFICATIONS) APPLY AND THE MORE RESTRICTIVE SPECIFICATION BETWEEN THESE DRAWINGS AND THE PROJECT MANUAL SHALL APPLY.
3. ALL OMISSIONS OR CONFLICTS, INCLUDING DIMENSIONS, BETWEEN THE VARIOUS ELEMENTS OF THE CONSULTANTS' DRAWINGS AND/OR SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH ANY WORK INVOLVED.
4. THE STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH THE CIVIL AND MEP DRAWINGS. PRIMARY STRUCTURAL ELEMENTS AND OVERALL STRUCTURAL LAYOUT ARE INDICATED WITH THE STRUCTURAL PLANS AND DETAILS. SOME SECONDARY ELEMENTS, LAYOUTS, ELEVATIONS, SLOPES, DEPRESSIONS, CURBS, MECHANICAL EQUIPMENT AND ELECTRICAL EQUIPMENT, ARE NOT INDICATED WITH THE STRUCTURAL DRAWINGS. DETAILING AND SHOP DRAWING PRODUCTION FOR THE STRUCTURAL ELEMENTS WILL REQUIRE INFORMATION (INCLUDING DIMENSIONS) CONTAINED IN THE CIVIL, STRUCTURAL, AND MEP DRAWINGS.
5. DO NOT SCALE THESE DRAWINGS, USE THE DIMENSIONS SHOWN.
6. NO STRUCTURAL MODIFICATIONS, ALTERATIONS, OR REPAIRS SHALL BE MADE WITHOUT PRIOR REVIEW BY THE STRUCTURAL ENGINEER.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MEANS, METHODS AND SAFETY OF ERECTION OF THE STRUCTURE, AND SHALL PROVIDE TEMPORARY SHORING AND BRACING AS THE CONTRACTOR'S METHOD REQUIRES TO PROVIDE ADEQUATE VERTICAL AND LATERAL SUPPORT. TEMPORARY SHORING AND BRACING SHALL REMAIN IN PLACE AS THE CHOSEN METHOD REQUIRES UNTIL ALL PERMANENT MEMBERS ARE IN PLACE AND ALL FINAL CONNECTIONS ARE COMPLETED. THE BUILDING SHALL NOT BE CONSIDERED STABLE UNTIL ALL CONNECTIONS ARE COMPLETE.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ALL SAFETY REGULATIONS, PROGRAMS AND PRECAUTIONS RELATED TO ALL WORK ON THIS PROJECT.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE PROTECTION OF PERSONS AND PROPERTY EITHER ON OR ADJACENT TO THE PROJECT AND SHALL PROTECT IT AGAINST INJURY, DAMAGE, OR LOSS.

01.00 - BASIS OF DESIGN:

1. GOVERNING CODES:
   A. ASCE 7-16 MINIMUM DESIGN LOADS FOR BUILDINGS & OTHER STRUCTURES.
2. RISK CATEGORY: I [ ], II [X], III [ ], IV [ ]
3. DEAD LOADS:
   A. STRUCTURE SELF-WEIGHT
4. LIVE LOADS:
   A. CONCRETE SLABS-ON-GRADE:
      a. 16.5 KIP WHEEL LOAD FROM CASE 921G FRONT END LOADER
5. EARTHQUAKE DESIGN DATA:
   - MAPPED SPECTRAL RESPONSE ACCELERATION, S_S=0.44 AND S_1=0.13
   - SITE CLASS: A [ ], B [ ], C [ ], D [X], E [ ], F [ ]
   - DESIGN SPECTRAL RESPONSE ACCELERATION, S_{DS}=0.41 AND S_{D1}=0.23
6. GEOTECHNICAL DATA:
   A. SOURCE: GEOTECHNICAL INVESTIGATION AND REPORT WAS PROVIDED FOR, BY PIONEER TECHNICAL SERVICES, REPORT TITLE, "GARDEN CITY COMPOST GEOTECHNICAL REPORT", DATED FEB. 9, 2024.
   B. SOIL BEARING PRESSURE (ASD): 3,000 PSF (STRUCTURAL FILL)
   C. COEFFICIENT OF FRICTION: 0.5
   D. EQUIVALENT FLUID PRESSURE:
      1. ACTIVE CASE: 38 PSF/FT
      2. AT REST CASE: 60 PSF/FT
      3. PASSIVE CASE: 480 PSF/FT
   E. ONE-THIRD STRESS INCREASE FOR WIND OR EARTHQUAKE LOADS

01.14 - SPECIAL INSPECTION:

1. SPECIAL INSPECTIONS SHALL BE COMPLETED.
2. SPECIAL INSPECTOR QUALIFICATIONS: THE SPECIAL INSPECTOR SHALL PROVIDE WRITTEN DOCUMENTATION TO THE BUILDING OFFICIAL DEMONSTRATING HIS OR HER COMPETENCE AND RELEVANT EXPERIENCE OR TRAINING.
3. ACCESS FOR SPECIAL INSPECTION: THE CONSTRUCTION OR WORK FOR WHICH SPECIAL INSPECTION IS REQUIRED SHALL REMAIN ACCESSIBLE AND EXPOSED FOR SPECIAL INSPECTION PURPOSES UNTIL THE REQUIRED SPECIAL INSPECTIONS ARE COMPLETE.
4. REPORT REQUIREMENT: SPECIAL INSPECTORS SHALL KEEP RECORDS OF INSPECTIONS. THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE BUILDING OFFICIAL, AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. REPORTS SHALL INDICATE THAT WORK INSPECTED WAS OR WAS NOT COMPLETED IN CONFORMANCE TO APPROVED CONSTRUCTION DOCUMENTS. DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF THEY ARE NOT CORRECTED, THE DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE BUILDING OFFICIAL AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE PRIOR TO THE COMPLETION OF THAT PHASE OF THE WORK. A FINAL REPORT DOCUMENTING REQUIRED SPECIAL INSPECTIONS AND CORRECTION OF ANY DISCREPANCIES NOTED IN THE INSPECTIONS SHALL BE SUBMITTED AT A POINT IN TIME AGREED UPON PRIOR TO THE START OF WORK BY THE APPLICANT AND THE BUILDING OFFICIAL.
5. STATEMENT OF SPECIAL INSPECTION - THE FOLLOWING SECTIONS IDENTIFY THE REQUIRED MATERIALS, SYSTEMS, COMPONENTS AND WORK TO BE SPECIAL INSPECTED AND TESTED:
   A. SOILS

VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1. VERIFY THE MATERIALS BELOW SLABS AND FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.	-	X
2. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND REACH PROPER MATERIAL.	-	X
3. PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS.	-	X
4. VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.	X	-
2. PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.	-	X

B. CONCRETE:

VERIFICATION AND INSPECTION TASK	CONTINUOUS	PERIODIC
1. INSPECTION OF REINFORCING STEEL, INCLUDING PRESTRESSING TENDONS, AND PLACEMENT.	-	X
2. INSPECTION OF REINFORCING STEEL WELDING IN ACCORDANCE WITH TABLE 1705.2.2, ITEM 2b.	-	-
3. INSPECTION OF ANCHORS CAST IN CONCRETE WHERE ALLOWABLE LOADS HAVE BEEN INCREASED OR WHERE STRENGTH DESIGN IS USED.	-	X
4. VERIFYING USE OF REQUIRED MIX DESIGN.	-	X

C. PLUMBING, MECHANICAL AND ELECTRICAL COMPONENTS: PERIODIC INSPECTION FOR:
   a. ANCHORAGE OF ELECTRICAL EQUIPMENT FOR EMERGENCY AND STANDBY POWER SYSTEMS.
   b. INSTALLATION AND ANCHORAGE OF PIPING SYSTEMS DESIGNED TO CARRY HAZARDOUS MATERIALS AND THEIR ASSOCIATED MECHANICAL UNITS.
   c. INSTALLATION AND ANCHORAGE OF DUCTWORK DESIGNED TO CARRY HAZARDOUS MATERIALS.

MONTANA
TYLER R. JIRGES
No. 87469 PE
LICENSED PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A. Eckhart, P.E.
Drawn By: E. Swanson
Approved By: Matt Miller, P.E.
Checked By: Tyler Jirges, P.E.
Designed By: Tyler Jirges, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

RPA
602 S. Ferguson Ave. STE 5
Bozeman, MT 59718
Phone (406) 284-2110

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Structural Notes**

Sheet: **S-1**

03.30 CAST-IN-PLACE:

1. CONCRETE CONSTRUCTION & MATERIALS SHALL COMPLY WITH THE STANDARDS SPECIFIED IN AMERICAN CONCRETE INSTITUTE (ACI) 318-19, "*BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE*" FOR BUILDING STRUCTURES. ENVIRONMENTAL STRUCTURES SHALL COMPLY WITH ACI 350-20, "CODE REQUIREMENTS FOR ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES".
2. CONCRETE
3. CONCRETE STRENGTH DESIGN REQUIREMENTS SHALL BE AS FOLLOWS:

CONCRETE MIX DESIGNS

COMPONENT	f'c at 28 Days (psi)	Max w/cm Ratio	Air Content (%)	Max Aggregate Size	Exposure Classes*		
					F	S	C
Footings	4500	0.42	4.5	1	F1	S0	C1
Foundation Walls/Push Walls	4500	0.42	6	1	F2	S0	C1
Slab-on-grade (exterior)	4500	0.42	3	1	F2	S0	C1

SEE SPEC. SECTION 03 30 00 FOR MIX DESIGN REQUIREMENTS.

4. REINFORCEMENT MATERIALS
   A. DEFORMED REINFORCING BARS SHALL CONFORM TO:
      a. ASTM A615 - STANDARD REINFORCING, GRADE 60; GRADE 40 SHALL BE ALLOWED FOR #3 AND SMALLER BARS
      b. ASTM A706 - REINFORCING TO BE WELDED, GRADE 60
5. CONSTRUCTION REQUIREMENTS
   A. LOCATION OF CONSTRUCTION JOINTS NOT SHOWN ON THE DRAWINGS SHALL BE APPROVED BY THE ENGINEER. CONSTRUCTION JOINTS SHALL NOT BE PLACED AT LOCATION OTHER THAN THOSE SHOWN ON DRAWINGS UNLESS PRIOR WRITTEN APPROVAL IS OBTAINED FROM THE ENGINEER.
   B. FINISH ALL CONCRETE IN ACCORDANCE WITH SPEC. SECTION 03 30 00.
   C. REINFORCING BARS SHALL NOT BE WELDED UNLESS SPECIFICALLY SHOWN ON DRAWINGS.
   D. FIELD BENDING OF REINFORCEMENT PARTIALLY EMBEDDED IN CONCRETE SHALL NOT BE PERMITTED, EXCEPT AS SHOWN IN THE CONSTRUCTION DOCUMENTS.
   E. OFFSET BARS SHALL BE BENT BEFORE PLACEMENT IN THE FORMS.
   F. ALL REINFORCEMENT SHALL BE BENT COLD, AND SHALL BE BENT ONLY ONCE AT THE SAME LOCATION. ALL REINFORCEMENT SHALL BE SHOP BENT, UNLESS OTHERWISE PERMITTED BY THE EOR.
   G. CONCRETE COVER FOR CAST-IN-PLACE NONPRESTRESSED CONCRETE MEMBERS.
      a. CAST AGAINST AND PERMANENTLY IN CONTACT WITH GROUND: COVER = 3"
      b. FORMED CONCRETE EXPOSTED TO EARTH, LIQUID, WEATHER OR BEARING ON WORK MAT OR SLABS SUPPORTING EARTH COVER:
      c. CONDITIONS NOT COVERED BY "a" OR "b" SECTION PREVIOUSLY:
         SLABS, JOISTS, & WALLS:
            No. 11 BAR & SMALLER - COVER = 3/4"
            No. 14 & No. 18 BARS - COVER = 1-1/2"
         BEAMS, COLUMNS:
            STIRRUPS, TIES, SPIRALS, HOOPS - COVER = 1-1/2"
            PRIMARY REINF. - COVER = 2"
   H. REINFORCING SHALL BE ACCURATELY FORMED TO DIMENSIONS INDICATED IN DRAWINGS AND PER BENDING DETAILS- SEE DETAIL 5/S10-1.
   I. NO PLICING SHALL BE PERMITTED EXCEPT AS NOTED ON DRAWINGS. WHERE PERMITTED SPLICES MAY BE MADE BY CONTACT LAPS - SEE LAP DETAIL 3/S10-1.

03.30 CAST-IN-PLACE CONTINUED:

6. PLACEMENT TOLERANCE
   a. PLACEMENT OF NONPRESTRESSED REINFORCEMENT
      - WHEN MEMBER DEPTH (OR THICKNESS) IS 4" OR LESS: ±1/4"
      - WHEN MEMBER DEPTH (OR THICKNESS) IS OVER 4" AND NOT OVER 12": ±3/8"
      - WHEN MEMBER DEPTH (OR THICKNESS) IS OVER 12": ±1/2"
   b. CONCRETE COVER MEASURED PERPENDICULAR TO CONCRETE SURFACE
      - WHEN MEMEBER DEPTH (OR THICKNESS) IS 12" OR LESS: -3/8"
      - WHEN MEMEBER DEPTH (OR THICKNESS) IS OVER 12": -1/2"
      - REDUCTION IN COVER SHALL NOT EXCEED 1/3 THE SPECIFIED CONCRETE COVER
      - REDUCTION IN COVER TO FORMED SOFFITS SHALL NOT EXCEED 1/4"
   c. VERTICAL DEVIATION FOR SLAB-ON-GROUND REINFORCEMENT: ±3/4"
   d. CLEARANCE BETWEEN REINFORCEMENT OR BETWEEN REINFORCEMENT AND EMBEDMENT
      - ONE-QUARTER SPECIFIED DISTANCE NOT TO EXCEED: ±1"
      - DISTANCE BETWEEN REINFORCEMENT SHALL NOT BE LESS THAN THE GREATER OF THE BAR DIAMETER OR 1" FOR UNBUNDLED BARS
      - FOR BUNDLED BARS, THE DISTANCE BETWEEN BUNDLES SHALL NOT BE LESS THAN THE GREATER OF 1" OR A BAR DIAMETER DERIVED FROM THE EQUIVALENT TOTAL AREA OF ALL BARS IN THE BUNDLE
   e. SPACING OF NONPRESTRESSED REINFORCEMENT, MEASURED ALONG A LINE PARALLEL TO THE SPECIFIED SPACING
      - EXCEPT AS NOTED BELOW: ±3"
      - STIRRUPS, THE LESSOR OF ±3" OR ±1" PER FT OF BEAM DEPTH
      - TIES, THE LESSER OF ±3" OR ±1" PER FT OF LEAST COLUMN WIDTH
      - THE TOTAL NUMBER OFBARS SHALL NOT BE FEWER THAN THAT SPECIFIED
   f. LONGITUDINAL LOCATION OF BENDS IN BARS AND ENDS OF BARS
      - AT DISCONTINUOUS ENDS OF CORBELS AND BRACKETS: ±1/2"
      - AT DISCONTINUOUS ENDS OF OTHER ELEMENTS: ±1"
      - AT OTHER LOCATIONS: ±2"
   g. EMBEDDED LENGTH OF BARS AND LENGTH OF BAR LAPS
      - #3 THROUGH #11 BAR SIZES: -1"
      - #14 AND #18 BARS: -2"
   h. PLACEMENT OF SMOOTH ROD OR PLATE DOWELS IN SLAB-ON-GROUND
      - CENTERLINE OF DOWEL, VERTICAL DEVIATION MEASURED FROM BOTTOM OF CONCRETE SLAB AT THE JOINT FOR ELEMENT DEPTH 8" OR LESS: ±1/2" WHEN ELEMENT DEPTH IS OVER 8": ±1"
      - SPACING OF DOWELS, MEASURED ALONG A LINE PARALLEL TO THAT SPECIFIED SPACING: ±3"
      - THE TOTAL NUMBER OF DOWELS SHALL NOT BE FEWER THAN THAT SPECIFIED
      - CENTERLINE OF DOWEL WITH RESPECT TO A HORIZONTAL LINE THAT IS PERPENDICULAR TO THE PLANE ESTABLISHED BY THE JOINT
        1. HORIZONTAL DEVIATION: ±1/2"
        2. VERTICAL DEVIATION: ±1/2"
   i. ANCHOR BOLTS IN CONCRETE
      - TOP OF ANCHOR BOLTS SPECIFIED ELEVATION
        1. VERTICAL DEVIATION: ±1/2"
      - CENTERLINE OF INDIVIDUAL ANCHOR BOLTS FROM SPECIFIED LOCATION
        1. HORIZONTAL DEVIATION
           A. FOR 3/4" AND 7/8" BOLTS: ±1/4"
           B. FOR 1", 1-1/4" AND 1-1/2" BOLTS: ±3/8"
           C. FOR 1-3/4", 2", AND 2-1/2" BOLTS: ±1/2"

05.05 19 POST-INSTALLED ANCHORS:

1. POST-INSTALLED ANCHORS IN CONCRETE SHALL BE IN ACCORDANCE WITH THESE NOTES UNLESS NOTED DIFFERENTLY IN PLANS AND DETAILS. SEE PLANS AND DETAILS FOR ANCHOR TYPE, SIZE, AND SPACING. POST-INSTALLED ANCHORS SHALL NOT BE USED IN PLACE OF SPECIFIED CAST-IN-PLACE ANCHORS SPECIFIED IN DRAWINGS, UNLESS SPECIFIED IN PLANS OR DETAILS, OR WRITTEN APPROVAL BY ENGINEER OF RECORD.
2. QUALITY ASSURANCE: INSTALLER FOR DRILLED-IN ANCHORS SHALL HAVE AT LEAST (3) YEARS OF EXPERIENCE PERFORMING SIMILAR INSTALLATIONS.
3. STORE ANCHORS AND INJECTION ADHESIVE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
4. INSTALLATION OF POST-INSTALL ANCHORS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS.
5. INSTALLATION OF ADHESIVE ANCHORS THAT ARE TO BE UNDER SUSTAINED TENSION LOADING IN HORIZONTAL TO VERTICALLY OVERHEAD ORIENTATION SHALL BE DONE BY A CERTIFIED ADHESIVE ANCHOR INSTALLER (AAI) AS CERTIFIED THROUGH ACI AND IN ACCORDANCE WITH ACI 318.
6. ADHESIVE ANCHORS SHALL BE INSTALLED IN CONCRETE HAVING A MINIMUM AGE OF 21 DAYS AT TIME OF ANCHOR INSTALLATION. FOR INSTALLATIONS SOONER THAN 21 DAYS CONSULT ADHESIVE MANUFACTURER.
7. EXISTING REINFORCING SHALL NOT BE DAMAGED DURING INSTALLATION OF ANCHOR.
8. ALL MISDRILLED OR UNACCEPTABLE HOLES SHALL NOT BE USED.
9. REMOVE AND REPLACE MISPLACED OR MALFUNCTIONING ANCHORS. FILL EMPTY ANCHOR HOLES AND PATCH FAILED ANCHOR LOCATIONS WITH HIGH-STRENGTH NON-SHRINK GROUT.

05.05 FABRICATED METAL WORK:

1. STEEL SHAPES SHALL CONFORM TO THE FOLLOWING MATERIAL GRADES:
   A. MISC SHAPES INCLUDING
   B. EMBED PLATS, EMBED ANGLES, ETC: A36
   C. ASCE RAIL: 55Q
   D. PUSH WALL PLATES AT BIOSOLIDS AND PRE-COMPOST MIXING BINS: A400
2. BOLTS SHALL BE HIGH STRENGTH BOLTS CONFORMING TO THE FOLLOWING ASTM STANDARDS EXPECT WHERE NOTED OTHERWISE:
   A. UNLESS NOTED OTHERWISE: A325-N
   B. MACHINE BOLTS (MB) AND ANCHOR BOLTS (AB)
      a. STAINLESS STEEL MB AND AB: F593, TYPE 316
      b. STEEL MB: A307
      c. STEEL AB: F1554, GRADE 55
3. ITEMS EMBEDDED IN CONCRETE SHALL BE CLEAN AND FREE OF OIL, DIRT, AND PAINT.

31.00 EARTHWORK:

1. THE FOUNDATION DESIGN IS BASED UPON GEOTECHNICAL RECOMMENDATIONS CONTAINED IN THE REPORT, "GARDEN CITY COMPOST GEOTECHNICAL REPORT", BY "PIONEER GEOTECHNICAL SERVICES", DATED FEB. 9, 2024. RECOMMENDATIONS PROVIDED BY THIS REPORT SHALL BE FOLLOWED IN ADDITION TO SPECIFICATIONS AND DETAILS IN DRAWINGS.
2. REGISTERED PROFESSIONAL GEOTECHNICAL ENGINEER SHALL JUDGE SUITABILITY OF UNDERLYING MATERIAL TO SUPPORT FOUNDATIONS AND SHALL APPROVE BEARING MATERIAL BEFORE FOUNDATION INSTALLATION.
3. ALL FILL MATERIALS SHALL BE COMPACTED IN ACCORDANCE WITH RECOMMENDATIONS OF GEOTECHNICAL REPORT, WHEN PRODUCED FOR THE PROJECT, BUT NOT LESS THAN THE FOLLOWING:
   A. STRUCTURAL FILL: 95% OF *MAX DRY DENSITY.
   B. SOILS BENEATH SLABS: 95% OF *MAX DRY DENSITY
   C. BACKFILL: 95% OF *MAX DRY DENSITY
      *ASTM D698 STANDARD PROCTOR
      a. STAINLESS STEEL MB AND AB: F593, TYPE 316
      b. STEEL MB: A307
      c. STEEL AB: F1554, GRADE 55
4. ALL FOOTINGS/SLABS SHALL BEAR ON COMPACTED STRUCTURAL FILL, WHICH IS IN TURN SUPPORTED BY FIRM NATIVE SOIL SUBGRADE (POORLY GRADED GRAVELS WITH SAND AND COBBLES).
5. ALL PERIMETER FOOTINGS AND EXTERIOR FOOTINGS SHALL BEAR A MINIMUM OF 42IN BELOW FINISH GRADE, U.N.O.
6. CONTRACTOR IS RESPONSIBLE FOR THE SAFETY OF EXCAVATIONS, PROTECTION OF EXISTING UTILITIES AND STRUCTURES, ETC. WHETHER INDICATED OR NOT.
7. CONTRACTOR SHALL PROVIDE CONTINUOUS SITE DRAINAGE BY A MECHANICAL METHOD TO CONTROL SURFACE AND UNDERGROUND WATER AS REQUIRED TO MAINTAIN A DRY WORKING SITE.
8. COORDINATE UNDER GROUND UTILITIES AND PIPING WITH MECHANICAL, PLUMBING AND CIVIL DRAWINGS.
9. THE TOP SURFACE OF FOOTINGS SHALL BE LEVEL. FOOTING SHALL BE STEPPED PER STANDARD DETAIL WHERE IT IS NECESSARY TO CHANGE THE TOP SURFACE OF THE FOOTING.
10. PLACE BACKFILL AT EQUAL HEIGHT LIFTS EACH SIDE OF BURIED WALLS TO PREVENT UNBALANCED EARTH PRESSURES ACTING ON WALL.
11. DO NOT BACKFILL EARTH RETAINING WALLS UNTIL SPECIFIED STRENGTH IS ATTAINED.

MONTANA
TYLER R. JIRGES
No. 87469 PE
LICENSED PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A. Eckhart, P.E.
Drawn By: E. Swanson
Approved By: Matt Miller, P.E.
Checked By: Tyler Jirges, P.E.
Designed By: Tyler Jirges, P.E.

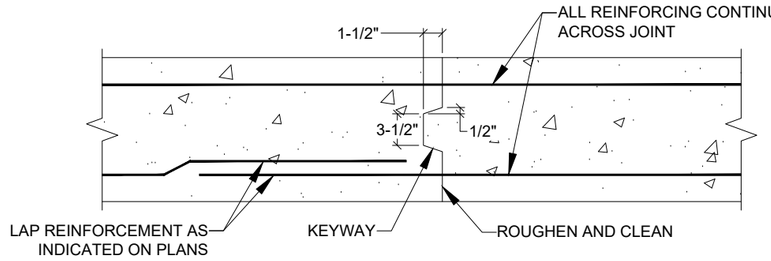
Engineer
Anderson~Montgomery
CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303
RPA
602 S. Ferguson Ave. STE 5
Bozeman, MT 59718
Phone (406) 284-2110

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Structural Notes Continued**

Sheet: **S-2**



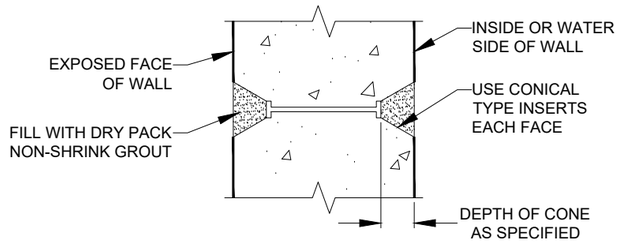
PLAN OR SECTION VIEW

Wall/Footing Construction Joint (1)

NO SCALE

NOTES:

- KEYWAY MAY BE OMITTED IN FOOTING CONSTRUCTION JOINTS.

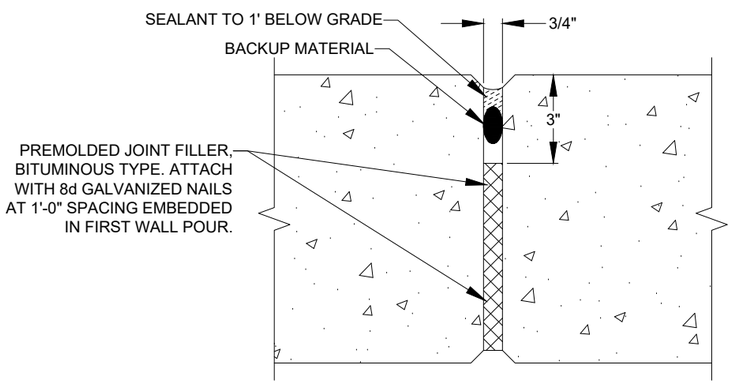


Form Snap-Tie Hole (3)

NO SCALE

NOTES:

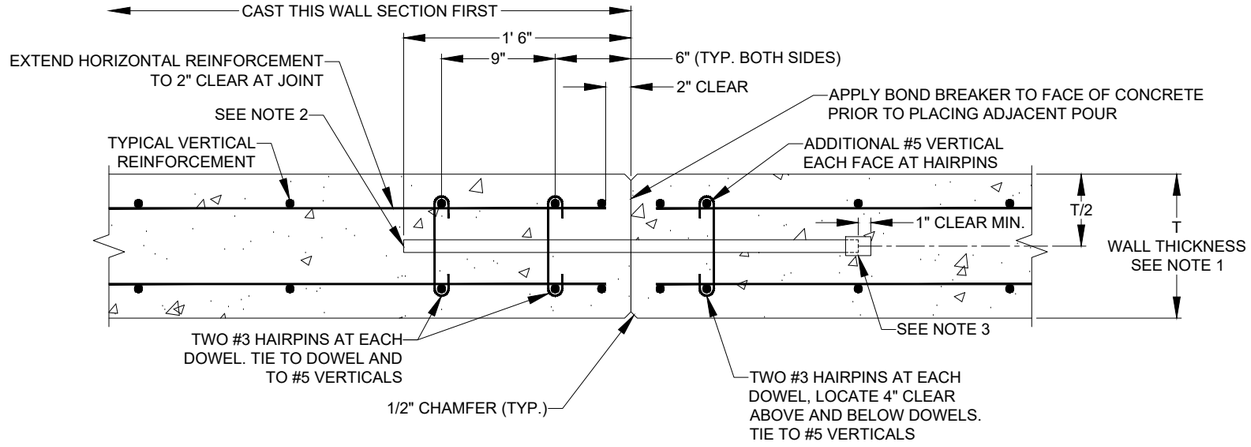
- THE SPACING OF FORM TIES ON EXPOSED PORTIONS OF WALLS SHALL BE APPROXIMATELY EQUAL HORIZONTALLY AND VERTICALLY AND SHALL BE UNIFORM IN EACH DIRECTION.
- DRY PACK METHOD SHALL BE AS SPECIFIED USING STEEL TOOLS.



PLAN VIEW

Wall Expansion Joint Treatment (4)

NO SCALE



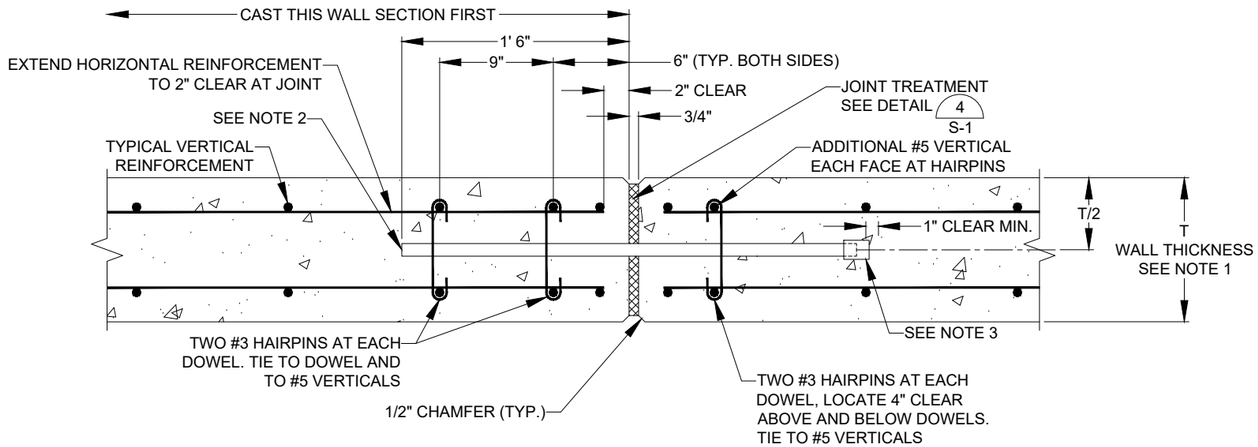
PLAN VIEW

Wall Vertical Control/Contraction Joint (2)

1 0.5 0 1 2 Feet

NOTES:

1. FOR WALLS WITH THICKNESS OF 10" THROUGH 24"
2. 1" DIA. x 3'-0" SMOOTH COATED BAR DOWELS. LOCATE AT 1'-0" MAX FROM T AND B OF WALL AND AT 2'-0" MAX SPACING. ALIGN AND TIE-IN-PLACE TO REINFORCEMENTS. COATING SHALL CONSIST OF A CORROSION RESISTANT COATING PLUS A LUBRICANT COATING AS SPECIFIED.
3. 1" ID x 2" PLASTIC CAP WITH 1" POLYSTYRENE BETWEEN END OF DOWEL AND END CAP. TAP TO BAR FOR WATERTIGHT SEAL.
4. MAXIMUM SPACING FOR WALL VERTICAL CONTROL/CONTRACTION JOINTS IS 40' (TYP.).



PLAN VIEW

Wall Vertical Expansion Joint (5)

1 0.5 0 1 2 Feet

NOTES:

1. FOR WALLS WITH THICKNESS OF 10" THROUGH 24"
2. 1" DIA. x 3'-0" SMOOTH COATED BAR DOWELS. LOCATE AT 1'-0" MAX FROM T AND B OF WALL AND AT 2'-0" MAX SPACING. ALIGN AND TIE-IN-PLACE TO REINFORCEMENTS. COATING SHALL CONSIST OF A CORROSION RESISTANT COATING PLUS A LUBRICANT COATING AS SPECIFIED.
3. 1" ID x 2" PLASTIC CAP WITH 1" POLYSTYRENE BETWEEN END OF DOWEL AND END CAP. TAP TO BAR FOR WATERTIGHT SEAL.

MONTANA — TYLER R. JIRGES No. 87469PE — LICENSED PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A. Eckhart, P.E.
Drawn By: E. Swanson
Approved By: Matt Miller, P.E.
Checked By: Tyler Jirges, P.E.
Designed By: Tyler Jirges, P.E.

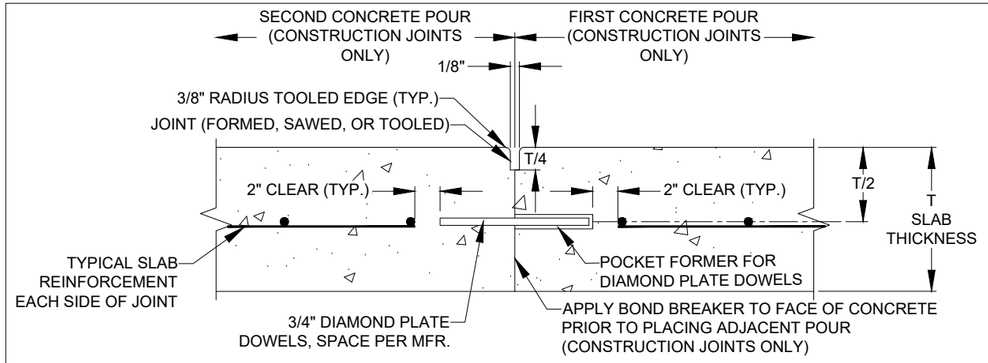
Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303
RPA
602 S. Ferguson Ave. STE 5
Bozeman, MT 59718
Phone (406) 284-2110

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Structural Details**

Sheet: **S-3**

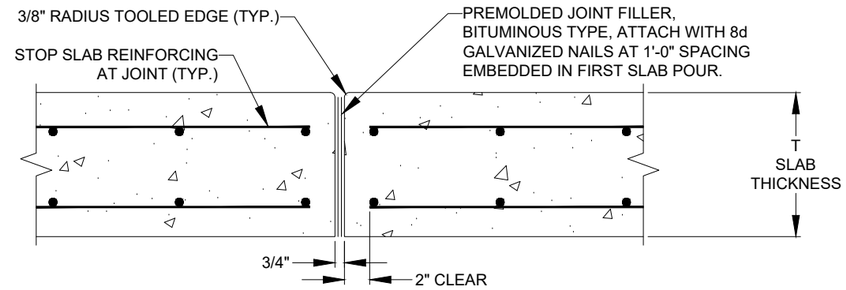


SECTION VIEW

Slab Control/Contraction Joint (1)

NO SCALE

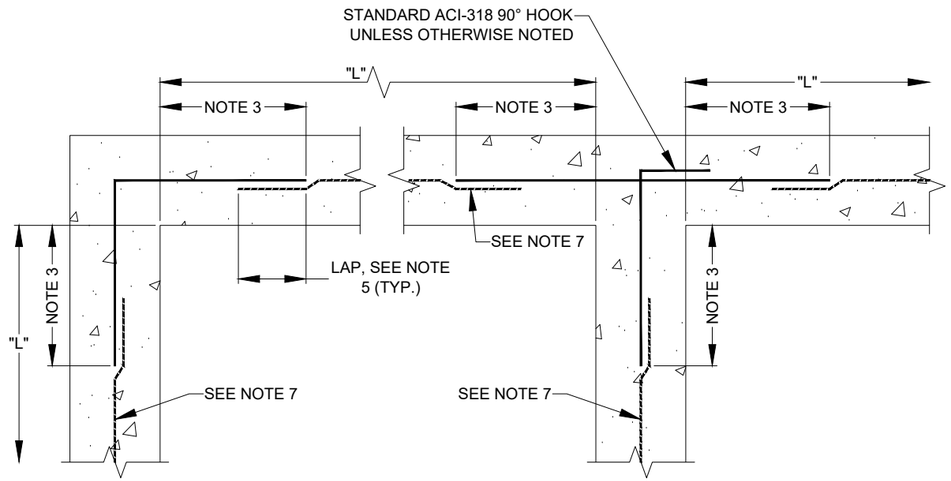
NOTES:
1. AT CONTRACTOR'S OPTION, CONTROL JOINTS MAY BE FORMED OR SAWED. JOINTS MUST BE SAWN BETWEEN 12 AND 24 HOURS AFTER CONCRETE HAS BEEN PLACED.
2. DESIGN OF DIAMOND PLATE DOWEL SPACING TO BE SUBMITTED TO EOR FOR REVIEW.
3. AT CONTRACTOR'S OPTION, DIAMOND PLATE DOWELS MAY BE SUBSTITUED WITH 3/4"x10" SMOOTH DOWELS SPACED AT 12" O.C., CENTERED IN DEPTH OF SLAB. HALF DOWEL ON EITHER SIDE OF JOINT SHALL BE COATED WITH LIQUID ASPHALT MC-250, ROAD TAR RT-6, OR APPROVED EQUAL TO REDUCE BOND WITH CONCRETE ON ONE SIDE OF JOINT.



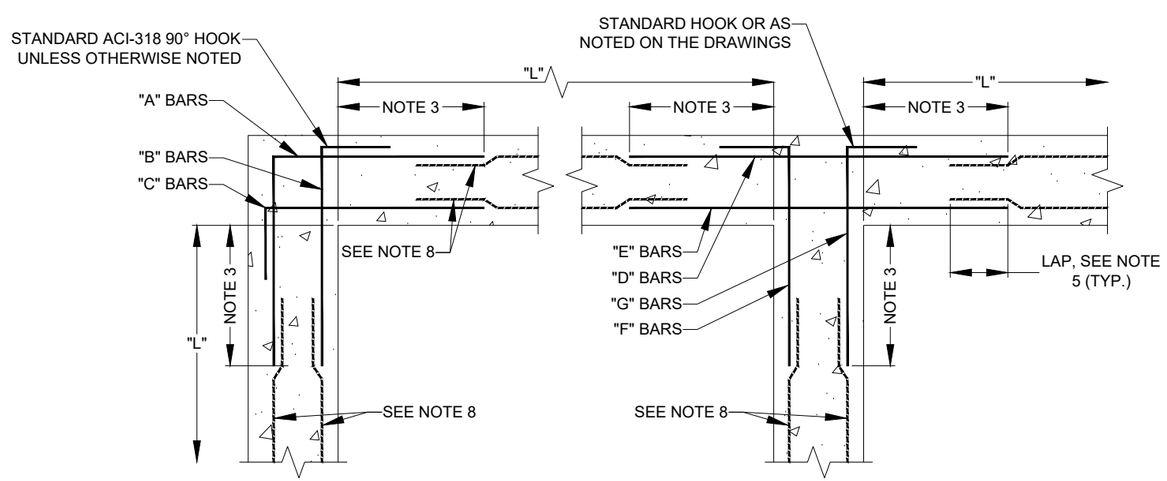
SECTION VIEW

Footing Construction/Expansion Joint (2)

NO SCALE



SINGLE REINFORCING MAT



DOUBLE REINFORCING MAT

Typical Wall Corner and Intersection Reinforcing (3)

NO SCALE

NOTES:
1. TYPICAL HORIZONTAL WALL CORNER AND INTERSECTION REINFORCING LAYOUT IS SHOWN TO AVOID CONGESTION AND PERMIT PROPER PLACEMENT, FOR SIZE AND SPACING SEE PLANS. ALL HORIZONTAL REINFORCING AT CORNERS AND INTERSECTIONS SHALL BE FABRICATED AND INSTALLED WITH SPLICES LOCATED WHERE SHOWN REGARDLESS OF BAR SIZE AND SPACING.
2. WHERE THE CORNER OR INTERSECTION REINFORCING SIZE AND SPACING IS NOT SHOWN, NOTED OR TABULATED ON THE PLANS, THE SIZE AND SPACING SHALL BE THE SAME AS THE WALL HORIZONTAL REINFORCING SHOWN ON THE WALL SECTIONS OR AS NOTED FOR THE REINFORCING BETWEEN THE CORNERS OR INTERSECTIONS.
3. EXCEPT WHERE OTHERWISE SHOWN ON THE DRAWINGS, THE LENGTH INDICATED AS "NOTE 3" SHALL BE THE LESSER OF L/4, 10 FEET, OR 1.0 TIMES THE HEIGHT OF THE WALL, EXCEPT THAT IN NO CASE SHALL IT BE LESS THAN 2 FEET.
4. L = LENGTH OF WALL PARALLEL TO THE BAR LENGTH IN QUESTION.
5. EXCEPT WHERE OTHERWISE SHOWN ON THE DRAWINGS, THE LENGTH INDICATED AS "NOTE 5" SHALL BE EQUAL TO ONE "LAP LENGTH" AS REQUIRED BY THE GENERAL STRUCTURAL NOTES. USE THE LAP LENGTH AS REQUIRED FOR THE SMALLER OF THE TWO REINFORCING BARS BEING SPLICED.
6. UNLESS OTHERWISE NOTED, "B" AND "C" BARS ARE THE SAME SIZE AND SPACING AND, "F" AND "G" BARS ARE THE SAME SIZE AND SPACING.
7. HORIZONTAL WALL REINFORCING BETWEEN CORNERS AND INTERSECTIONS AS SHOWN ON WALL SECTIONS, LAP WITH CORNER AND INTERSECTION REINFORCING.
8. TYPICAL HORIZONTAL WALL REINFORCING AS SHOWN ON DRAWINGS, LAP WITH CORNER AND INTERSECTION REINFORCING.

MONTANA LICENSED PROFESSIONAL ENGINEER
TYLER R. JIRGES
No. 87469 PE

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A. Eckhart, P.E.
Drawn By: E. Swanson
Approved By: Matt Miller, P.E.
Checked By: Tyler Jirges, P.E.
Designed By: Tyler Jirges, P.E.

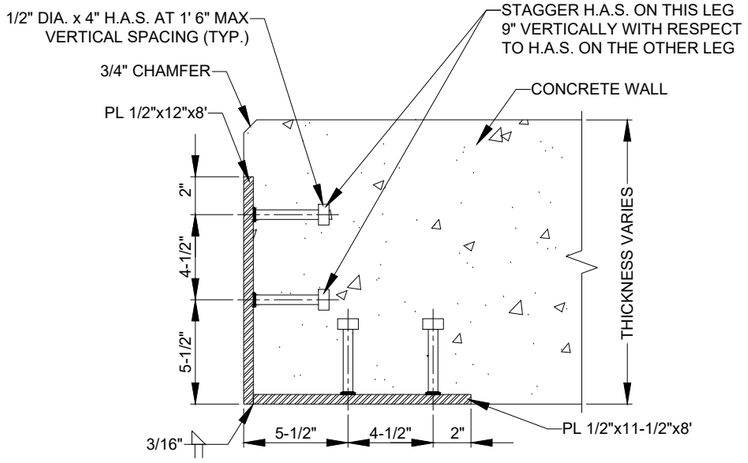
Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303
RPA
602 S. Ferguson Ave. STE 5
Bozeman, MT 59718
Phone (406) 284-2110

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Structural Details**

Sheet: **S-4**



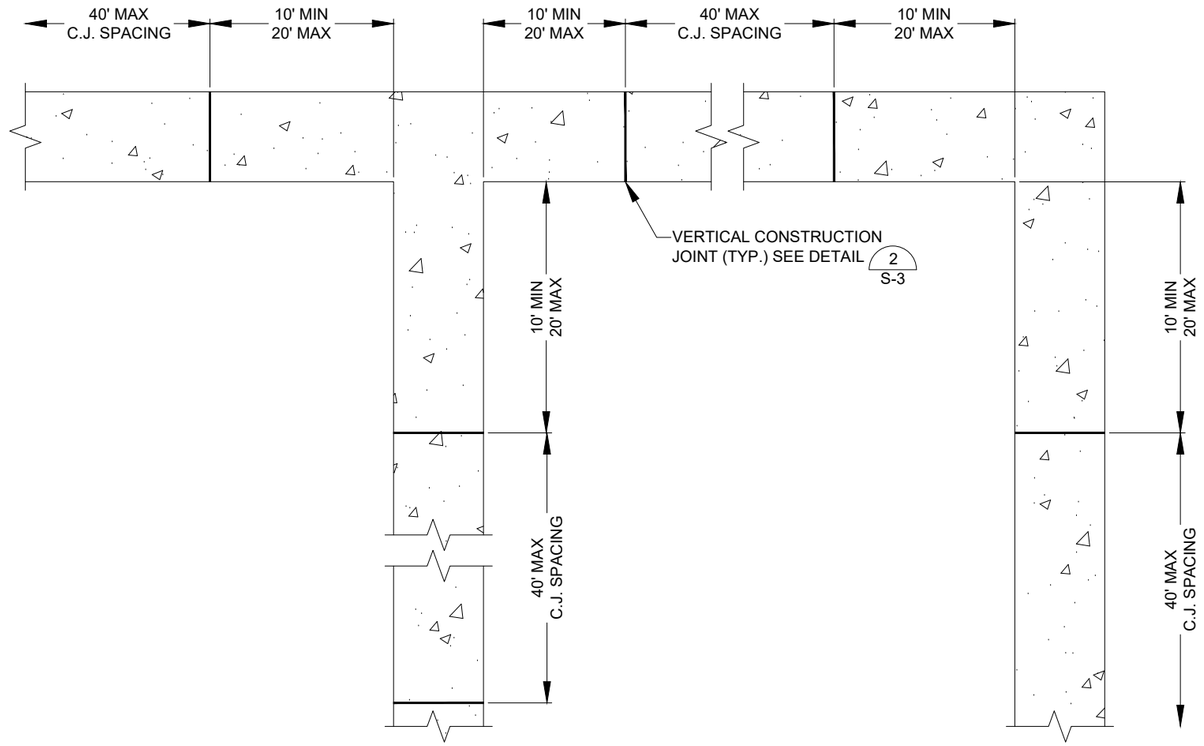
PLAN VIEW

Concrete Corner Armor Angle (1)

NO SCALE

NOTES:

- PAINT ASSEMBLY WITH SYSTEM NO. 4 AFTER FABRICATION.
- INSTALL BOTTOM OF ANGLE AT TOP OF SLAB ELEVATION.
- PROVIDE (1) VERTICAL ROW OF 3/16"Ø HOLES ALONG EACH ANGLE LEG FOR ATTACHMENT OF ANGLE TO FORMWORK.



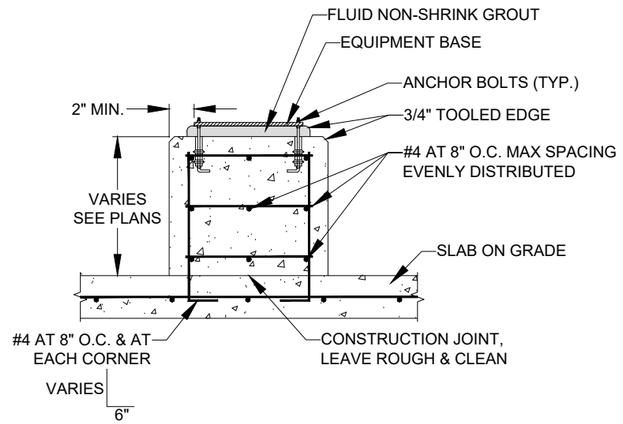
PLAN VIEW

Wall Construction Joint Spacing (2)

NO SCALE

NOTES:

- COORDINATE CONSTRUCTION JOINT LOCATIONS AND TIME BETWEEN CONCRETE POURS WITH PLANS AND PROJECT SPECIFICATIONS.
- LOCATE WALL CONSTRUCTION JOINTS AS SHOWN, UNLESS INDICATED OTHERWISE.

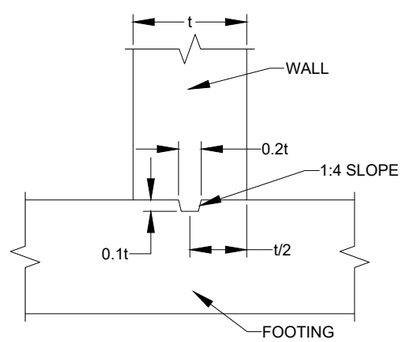


Blower/Fan Concrete Pedestal (3)

NO SCALE

NOTES:

- BARS SHALL BE PLACED ON 8" CENTERS AROUND PAD.
- ANCHOR BOLTS SHALL BE SIZED AND INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
- 3" MINIMUM COVER FOR ALL REBAR
- THE TAIL IN THE VERTICAL BARS SHALL BE LOCATED IN THE MIDDLE OF THE SLAB ON GRADE.
- REBAR SHALL BE TIED TOGETHER AT ALL CROSSINGS.



Wall/Footing Keyway Joint Detail (4)

NO SCALE

MONTANA
TYLER R. JIRGES
No. 87469 PE
LICENSED PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A. Eckhart, P.E.
Drawn By: E. Swanson
Approved By: Matt Miller, P.E.
Checked By: Tyler Jirges, P.E.
Designed By: Tyler Jirges, P.E.

Engineer

Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

RPA
602 S. Ferguson Ave. STE 5
Bozeman, MT 59718
Phone (406) 284-2110

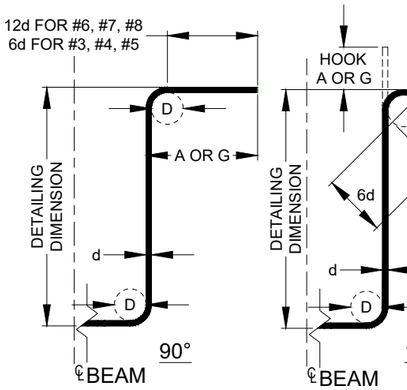
Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

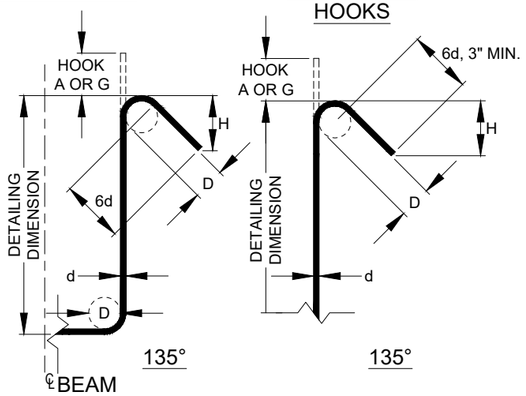
Sheet Title: **Structural Details**

Sheet: **S-5**

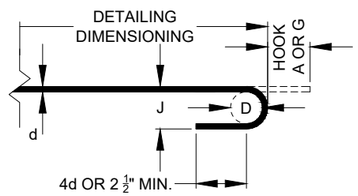
STIRRUP AND TIE HOOKS

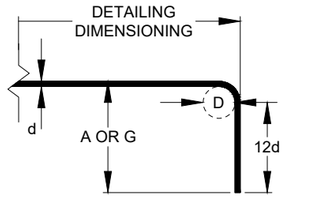


SEISMIC STIRRUP/TIE HOOKS



RECOMMENDED END HOOKS





NOTES:
- 'D' = BAR BEND DIAMETER
- 'd' = REINF. BAR DIAMETER

STIRRUP (TIES SIMILAR) STIRRUP AND TIE HOOK DIMENSIONS

BAR SIZE No.	D,* in.	90° HOOK	135° HOOK	
		HOOK A OR G, ft-in.	HOOK A OR G, ft-in	H APPROX., ft-in
#3	1 1/2	4	4	2 1/2
#4	2	4 1/2	4 1/2	3
#5	2 1/2	6	5 1/2	3 3/4
#6	4 1/2	1-0	8	4 1/2
#7	5 1/4	1-2	9	5 1/4
#8	6	1-4	10 1/2	6

135° SEISMIC STIRRUP/TIE HOOK DIMENSIONS

BAR SIZE No.	D,* in.	135° HOOK	
		HOOK A OR G, ft-in	H APPROX., ft-in
#3	1 1/2	4 1/4	3
#4	2	4 1/2	3
#5	2 1/2	5 1/2	3 3/4
#6	4 1/2	8	4 1/2
#7	5 1/4	9	5 1/4
#8	6	10 1/2	6

RECOMMENDED END HOOKS (D= FINISHED BEND DIAMETERS)

BAR SIZE No.	D,* in.	135° HOOK		90° HOOK
		A OR G, ft-in	J, ft-in	A OR G, ft-in.
#3	2 1/4	5	3	6
#4	3	6	4	8
#5	3 3/4	7	5	10
#6	4 1/2	8	6	1-0
#7	5 1/4	10	7	1-2
#8	6	11	8	1-4
#9	9 1/2	1-3	11 3/4	1-7
#10	10 3/4	1-5	1-1 1/4	1-10
#11	12	1-7	1-2 3/4	2-0
#14	18 1/4	2-3	1-9 3/4	2-7
#18	24	3-0	2-4 1/2	3-5

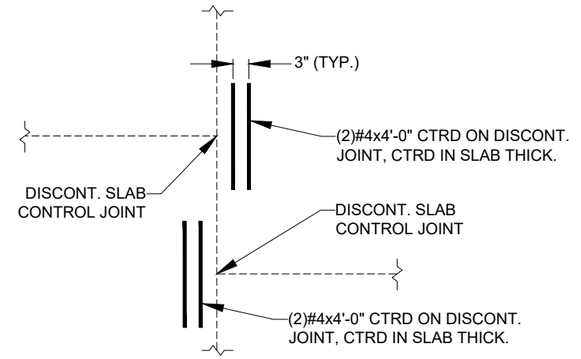
Standard Rebar Hooks (1)
NO SCALE S-6

CONCRETE REINFORCING BAR DEVELOPMENT & LAP SPLICE LENGTH SCHEDULE

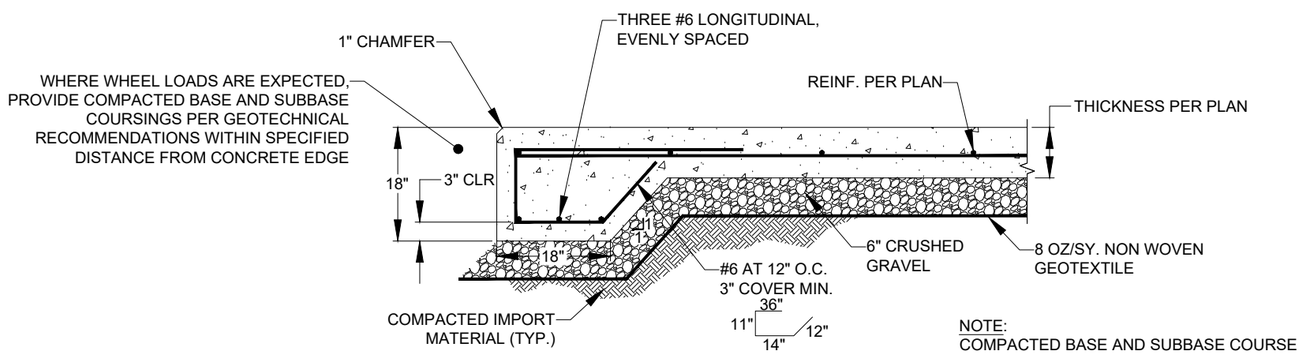
BAR SIZE "db" (GRADE 60)	f'c = 3500 PSI					f'c = 4000 PSI					f'c = 4500 PSI					f'c = 5000 PSI				
	L_d	L_t	L_{sb}	L_{sbt}	L_{dh}	L_d	L_t	L_{sb}	L_{sbt}	L_{dh}	L_d	L_t	L_{sb}	L_{sbt}	L_{dh}	L_d	L_t	L_{sb}	L_{sbt}	L_{dh}
#4	22"	29"	29"	38"	8"	19"	25"	25"	33"	7"	18"	24"	24"	31"	7"	17"	23"	23"	30"	6"
#5	28"	36"	36"	47"	10"	24"	31"	31"	41"	9"	23"	30"	30"	38"	8"	22"	28"	28"	37"	8"
#6	33"	43"	43"	56"	12"	29"	37"	37"	49"	10"	27"	35"	35"	46"	10"	26"	34"	34"	45"	9"
#7	48"	63"	63"	81"	14"	42"	54"	54"	71"	12"	40"	51"	51"	67"	11"	38"	49"	49"	64"	11"
#8	51"	67"	67"	86"	15"	48"	62"	62"	81"	14"	45"	59"	59"	77"	13"	43"	56"	56"	73"	12"
#9	58"	76"	76"	98"	16"	54"	70"	70"	91"	15"	51"	66"	66"	86"	15"	48"	63"	63"	82"	14"

NOTES:
1. ALL TABULATED VALUES REQUIRE CLEAR SPACING BETWEEN BARS ≥ 2*db & CLEAR COVER ≥ db (IF THESE CONDITIONS ARE NOT SATISFIED, MULTIPLY TABULATED VALUES BY 1.5)
2. L_d = TENSION DEVELOPMENT LENGTH
3. L_t = DEVELOPMENT LENGTH FOR "TOP" BARS IN TENSION.
4. L_{sb} = TENSION LAP SPLICE LENGTH FOR BARS OTHER THAN "TOP" BARS ("CLASS B")
5. L_{sbt} = TENSION LAP SPLICE LENGTH OF "TOP" BARS.
6. L_{dh} = TENSION HOOK DEVELOPMENT LENGTH (SIDE COVER ≥ 2 1/2", END COVER ≥ 2").
7. "TOP" BARS = REINFORCEMENT WITH > 12" OF FRESH CONCRETE CAST BELOW.

Reinforcing Bar Development Schedule (2)
NO SCALE S-6



Supplemental Reinf. At Discontinuous Control Joints (3)
NO SCALE S-6



NOTE:
COMPACTED BASE AND SUBBASE COURSE PER GEOTECHNICAL RECOMMENDATIONS

Thickened Edge Detail (4)
S-6

1 0.5 0 1 2
Feet

MONTANA
TYLER R. JIRGES
No. 87469 PE
LICENSED PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A. Eckhart, P.E.
Drawn By: E. Swanson
Approved By: Matt Miller, P.E.
Checked By: Tyler Jirges, P.E.
Designed By: Tyler Jirges, P.E.

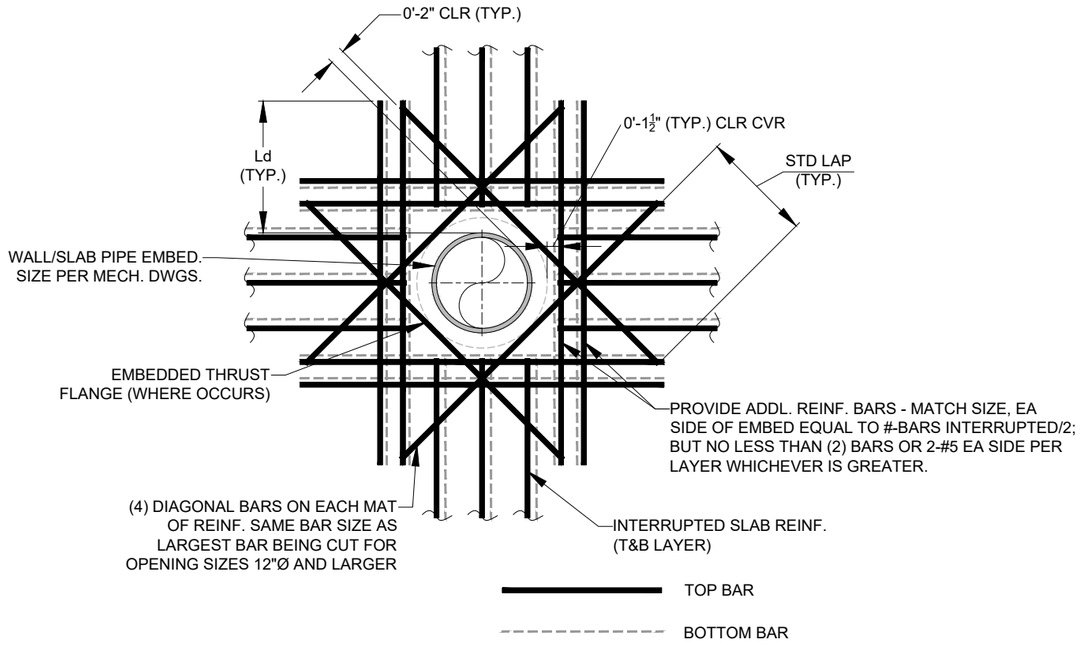
Engineer
Anderson~Montgomery
CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303
RPA
602 S. Ferguson Ave. STE 5
Bozeman, MT 59718
Phone (406) 284-2110

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

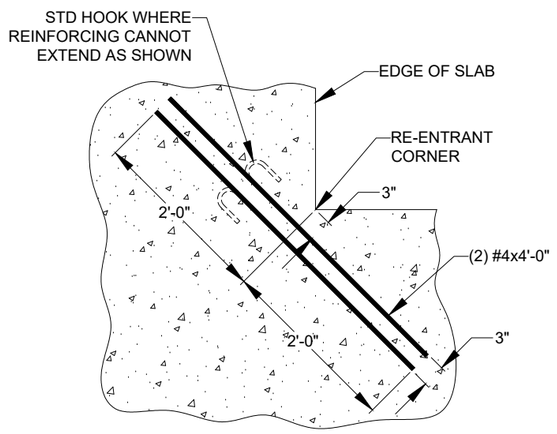
Sheet Title: **Structural Details**

Sheet: **S-6**



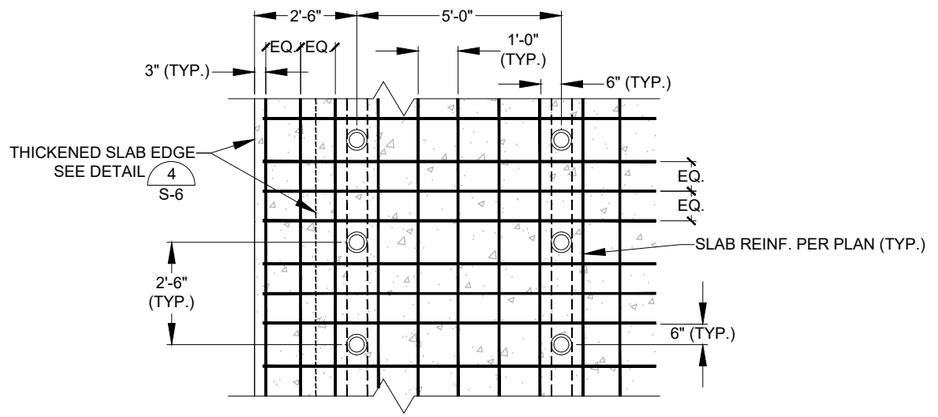
Standard Wall Pipe Embed In Slab/Wall (1)

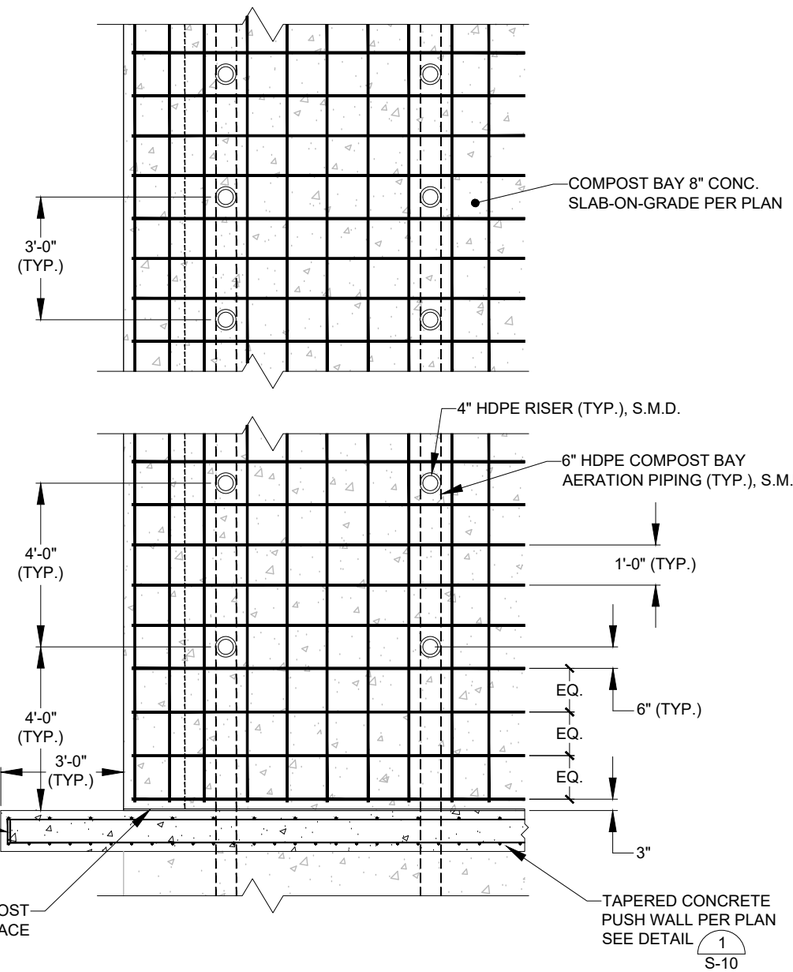
NO SCALE



Re-Entrant Corner Slab Reinforcement (2)

NO SCALE





Compost Bay Partial Slab Plan (3)

NO SCALE

MONTANA
TYLER R. JIRGES
No. 87469 PE
LICENSED PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A. Eckhart, P.E.
Drawn By: E. Swanson
Approved By: Matt Miller, P.E.
Checked By: Tyler Jirges, P.E.
Designed By: Tyler Jirges, P.E.

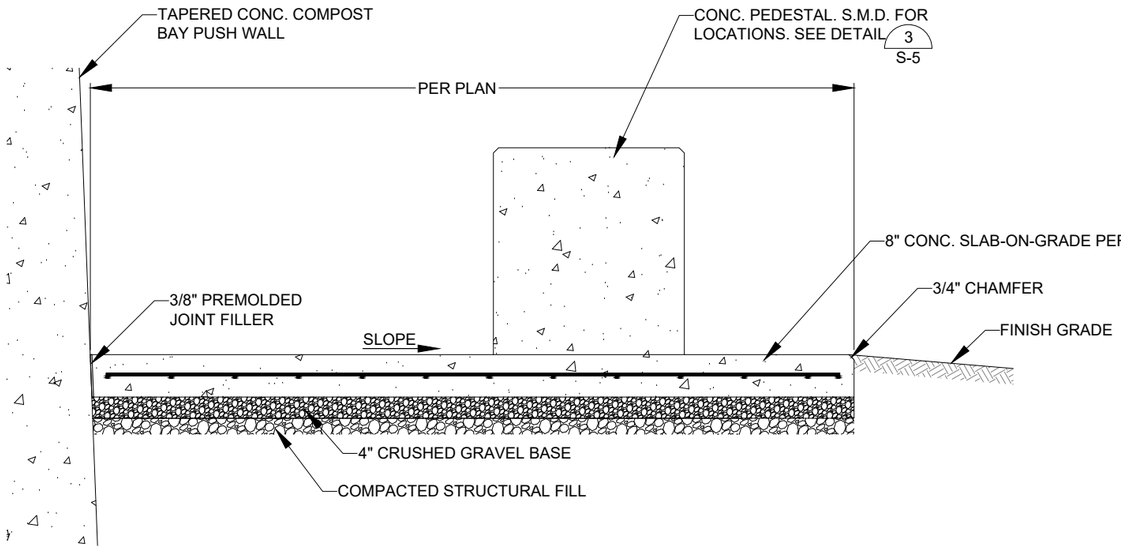
Engineer
Anderson~Montgomery
CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303
RPA
602 S. Ferguson Ave. STE 5
Bozeman, MT 59718
Phone (406) 284-2110

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Structural Details**

Sheet: **S-7**



Compost Bay Aeration Equipment Slab Section 1

NO SCALE

MONTANA
TYLER R. JIRGES
No. 87469 PE
LICENSED PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope

Plot Scale: 1:2

Drawn By: A. Eckhart, P.E.

Drawn By: E. Swanson

Approved By: Matt Miller, P.E.

Checked By: Tyler Jirges, P.E.

Designed By: Tyler Jirges, P.E.

Engineer

Anderson~Montgomery CONSULTING ENGINEERS

1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

RPA

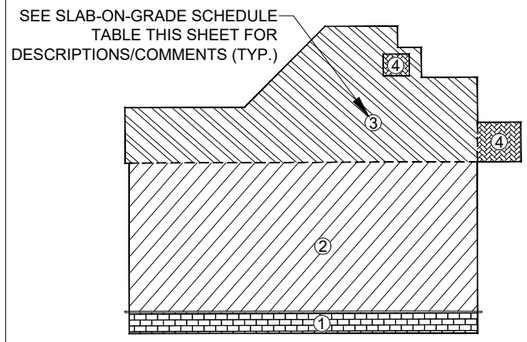
602 S. Ferguson Ave. STE 5
Bozeman, MT 59718
Phone (406) 284-2110

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

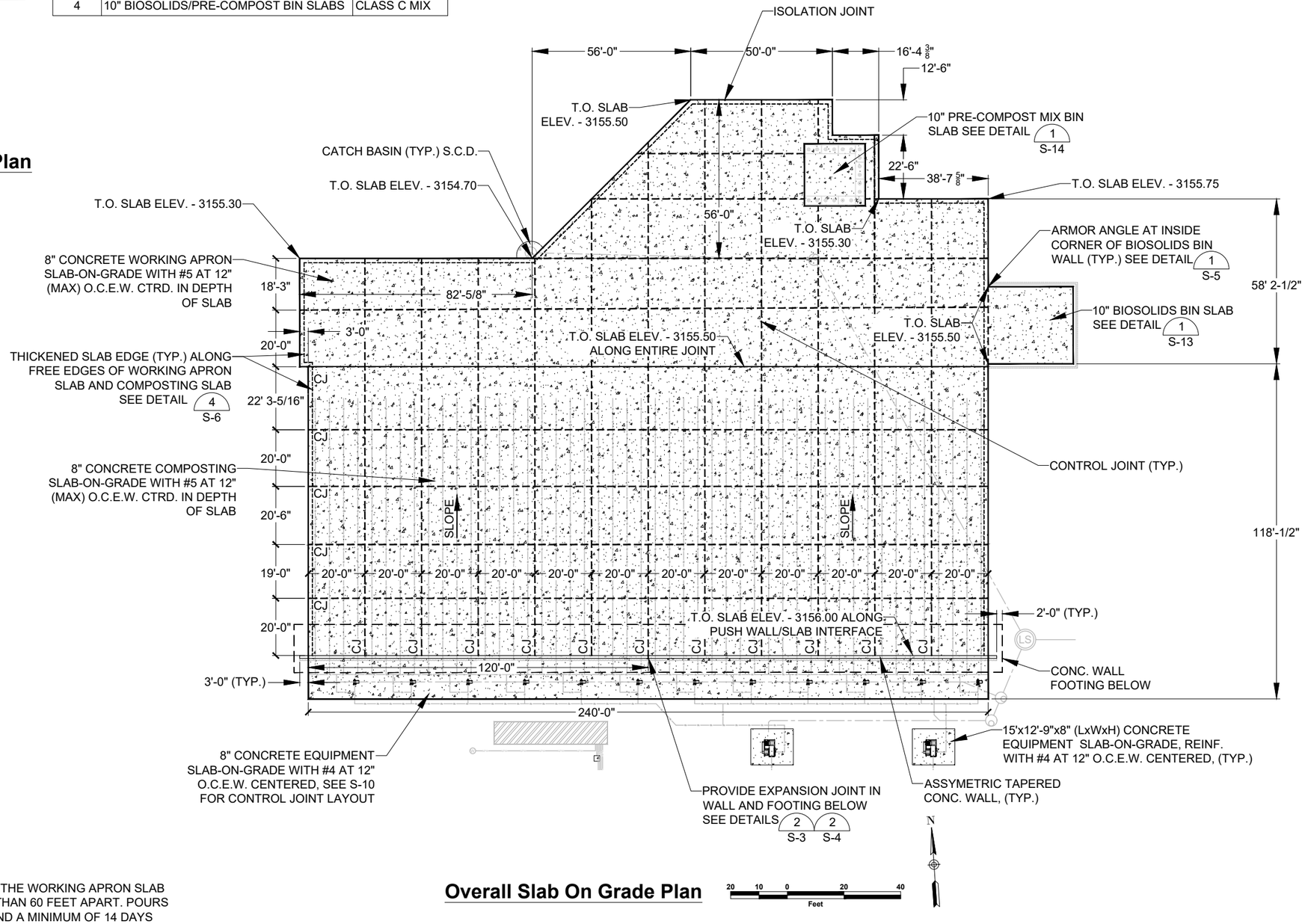
Sheet Title: **Structural Details**

Sheet: **S-8**



SLAB-ON-GRADE SCHEDULE		
MARK	DESCRIPTION	COMMENTS
1	8" EQUIPMENT SLAB	CLASS C MIX
2	8" COMPOST BAY SLAB	CLASS C MIX
3	8" WORKING APRON SLAB	CLASS C MIX
4	10" BIOSOLIDS/PRE-COMPOST BIN SLABS	CLASS C MIX

Overall Slab On Grade Partial Plan



Overall Slab On Grade Plan

PLAN NOTES:

1. CONSTRUCTION JOINTS SHALL BE PROVIDED WITHIN THE WORKING APRON SLAB AND COMPOSTING SLAB AND SPACED NO GREATER THAN 60 FEET APART. POURS SHALL BE PLACED IN A CHECKERBOARD PATTERN, AND A MINIMUM OF 14 DAYS SHALL BE PROVIDED BETWEEN ADJACENT POURS SHARING A CONSTRUCTION JOINT.
2. CONTROL JOINTS LOCATED WITHIN THE EQUIPMENT SLAB ARE ALLOWED TO BE EITHER TOOLED OR SAWCUT, SEE SHEET S-10 FOR JOINT SPACING.
3. GENERAL CONTRACTOR SHALL SUBMIT A POUR SEQUENCE PLACEMENT PLAN TO EOR FOR REVIEW PRIOR TO COMMENCEMENT OF CONSTRUCTION.

MONTANA TYLER R. JIRGES No. 87469 PE LICENSED PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A. Eckhart, P.E.
Drawn By: E. Swanson
Approved By: Matt Miller, P.E.
Checked By: Tyler Jirges, P.E.
Designed By: Tyler Jirges, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303
RPA
602 S. Ferguson Ave. STE 5
Bozeman, MT 59718
Phone (406) 284-2110

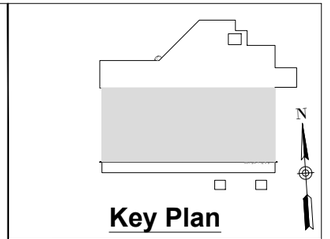
Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

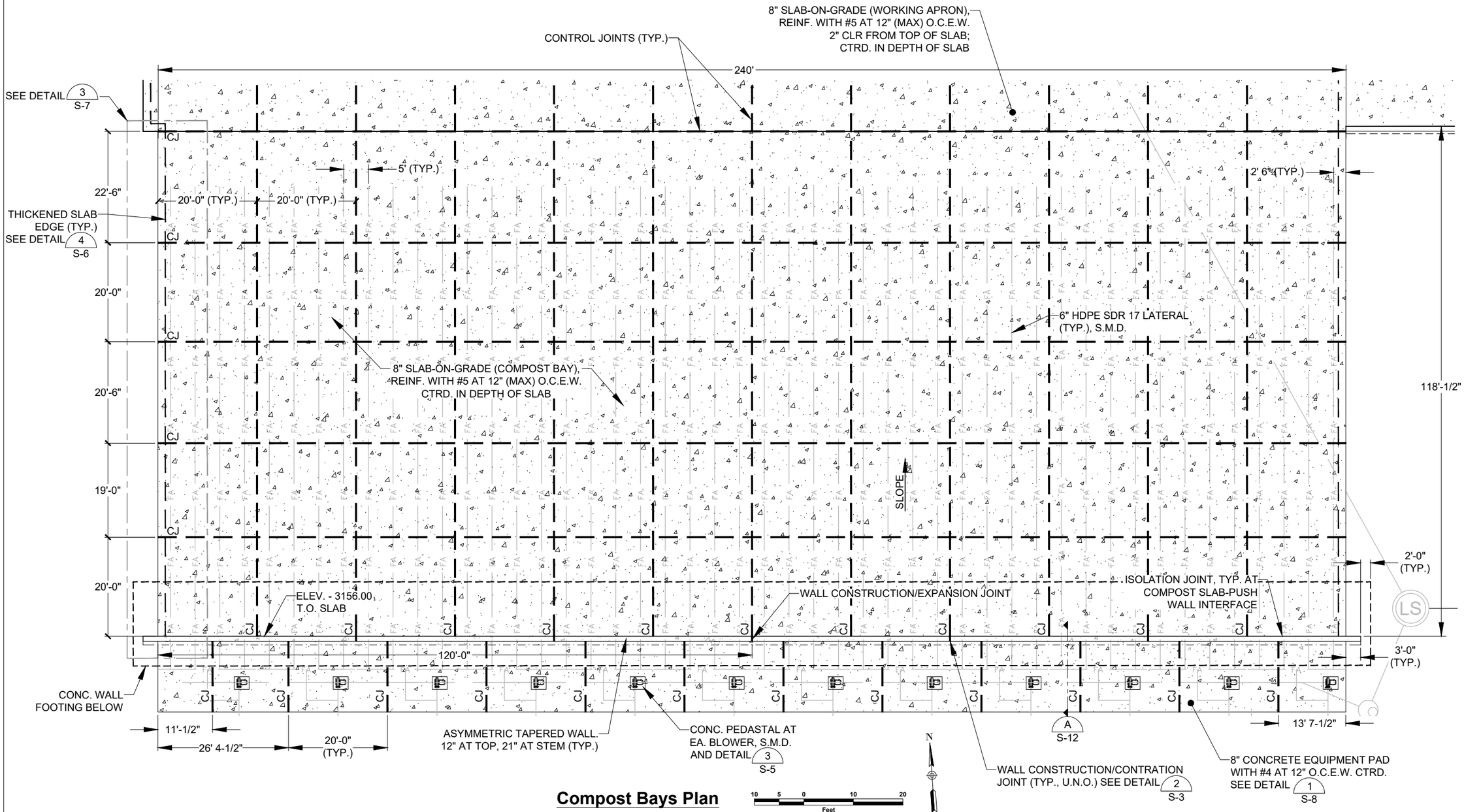
Sheet Title: **Overall Slab On Grade Plan**

Sheet: **S-9**

NOTES:
1. SEE MECHANICAL SHEETS FOR PIPING LAYOUT.
2. AT COMPOST BAY SLABS:
   - CONSTRUCTION JOINTS SHALL BE SPACED NO GREATER THAN 60 FEET APART. POURS SHALL BE PLACED IN A CHECKERBOARD PATTERN, AND A MINIMUM OF 14 DAYS SHALL BE PROVIDED BETWEEN ADJACENT POURS SHARING A CONSTRUCTION JOINT.
   - SPACING OF EAST-WEST CONTROL JOINTS IS SUCH THAT JOINTS ARE CENTERED ON IN-FLOOR GRATES AT THE TOPS OF RISERS.
   - SPACING OF NORTH-SOUTH CONTROL JOINTS IS SUCH THAT JOINTS ARE CENTERED EQUALLY BETWEEN PIPING LATERALS.
   - COORDINATE WITH MECHANICAL DRAWINGS AND FIELD INSTALLATION OF PIPING TO ENSURE CORRECT LOCATION OF JOINTS.
3. AT EQUIPMENT SLAB, CONTROL JOINTS MAY BE EITHER TOOLED OR SAWCUT.



Key Plan



Compost Bays Plan

MONTANA
TYLER R. JIRGES
No. 87469 PE
LICENSED PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A. Eckhart, P.E.
Drawn By: E. Swanson
Approved By: Matt Miller, P.E.
Checked By: Tyler Jirges, P.E.
Designed By: Tyler Jirges, P.E.

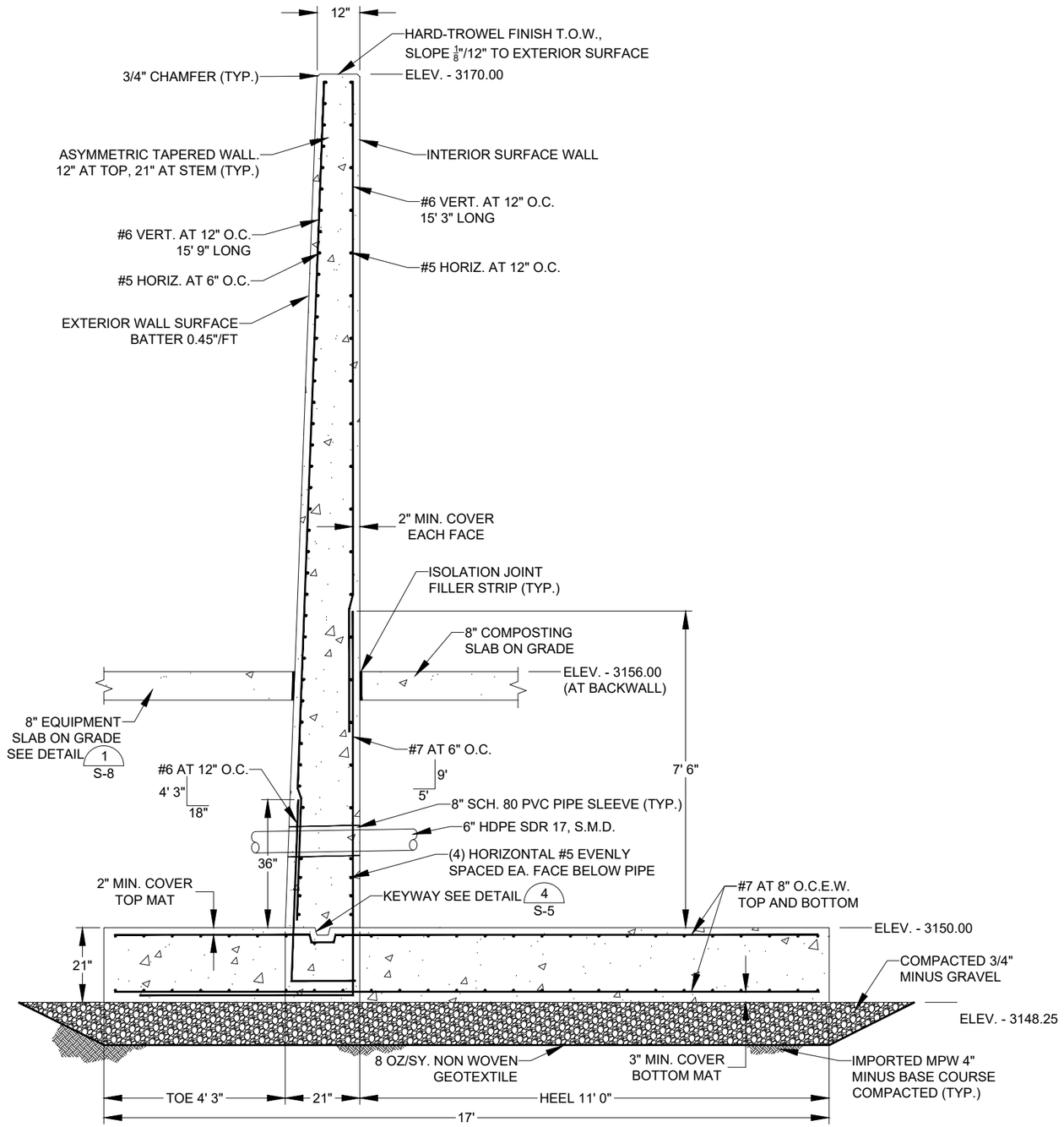
Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303
RPA
602 S. Ferguson Ave. STE 5
Bozeman, MT 59718
Phone (406) 284-2110

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Compost Bays**

Sheet: **S-10**



External Compost Wall Section A S-10

1.5 0.75 0 1.5 3
Feet

NOTE:

- SUBGRADE BENEATH SLAB-ON-GRADE NOT SHOWN FOR DRAWING CLARITY. SUBGRADE SHALL BE IMPORTED MPW 4" MINUS BASE COURSE COMPACTED.
- FOR REINFORCEMENT REQUIREMENTS WHERE INTERRUPTED BY PIPE PENETRATIONS SEE DETAIL 1 S-7

MONTANA
TYLER R. JIRGES
No. 87469 PE
LICENSED PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A. Eckhart, P.E.
Drawn By: E. Swanson
Approved By: Matt Miller, P.E.
Checked By: Tyler Jirges, P.E.
Designed By: Tyler Jirges, P.E.

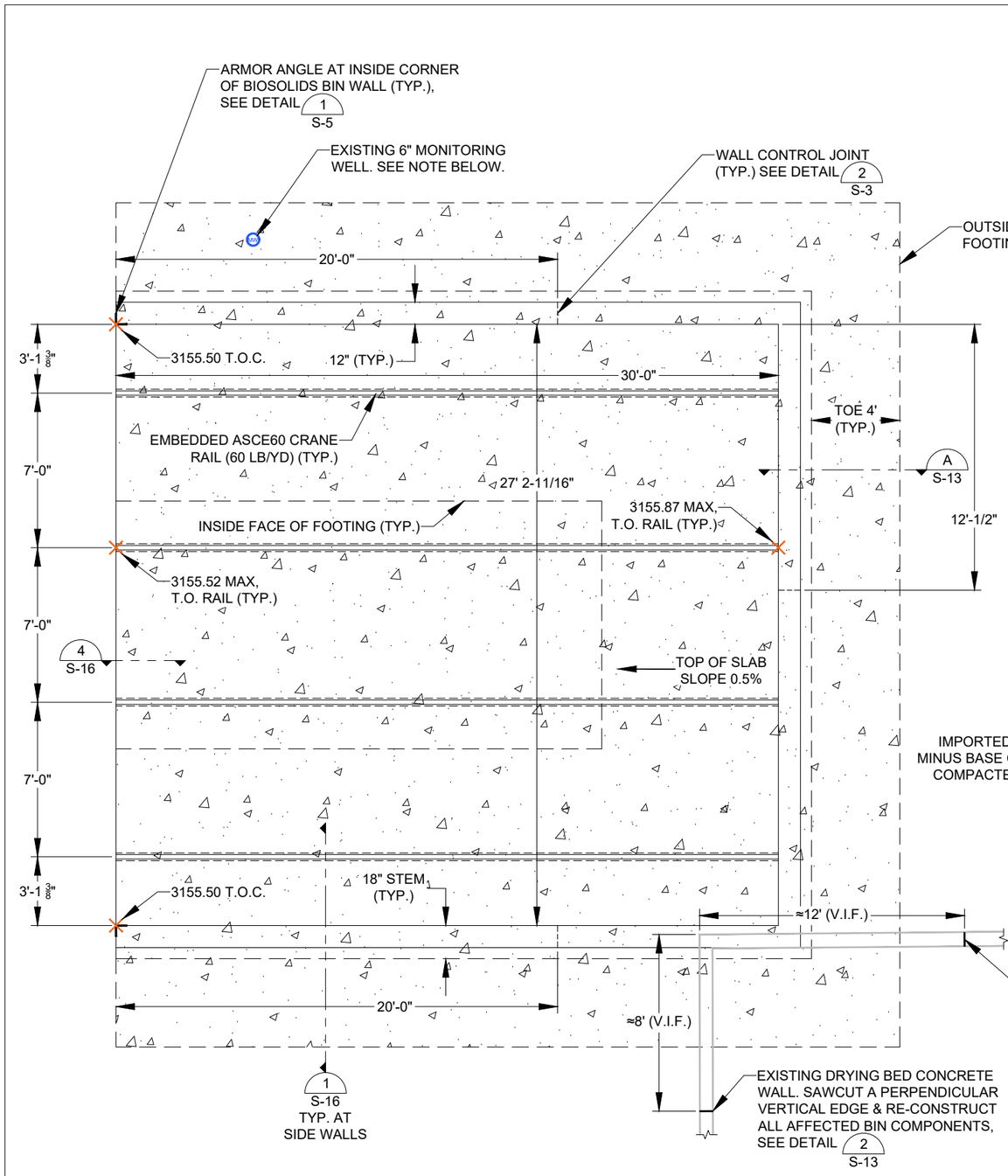
Engineer
Anderson~Montgomery
CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303
RPA
602 S. Ferguson Ave. STE 5
Bozeman, MT 59718
Phone (406) 284-2110

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Push Wall Section**

Sheet: **S-12**

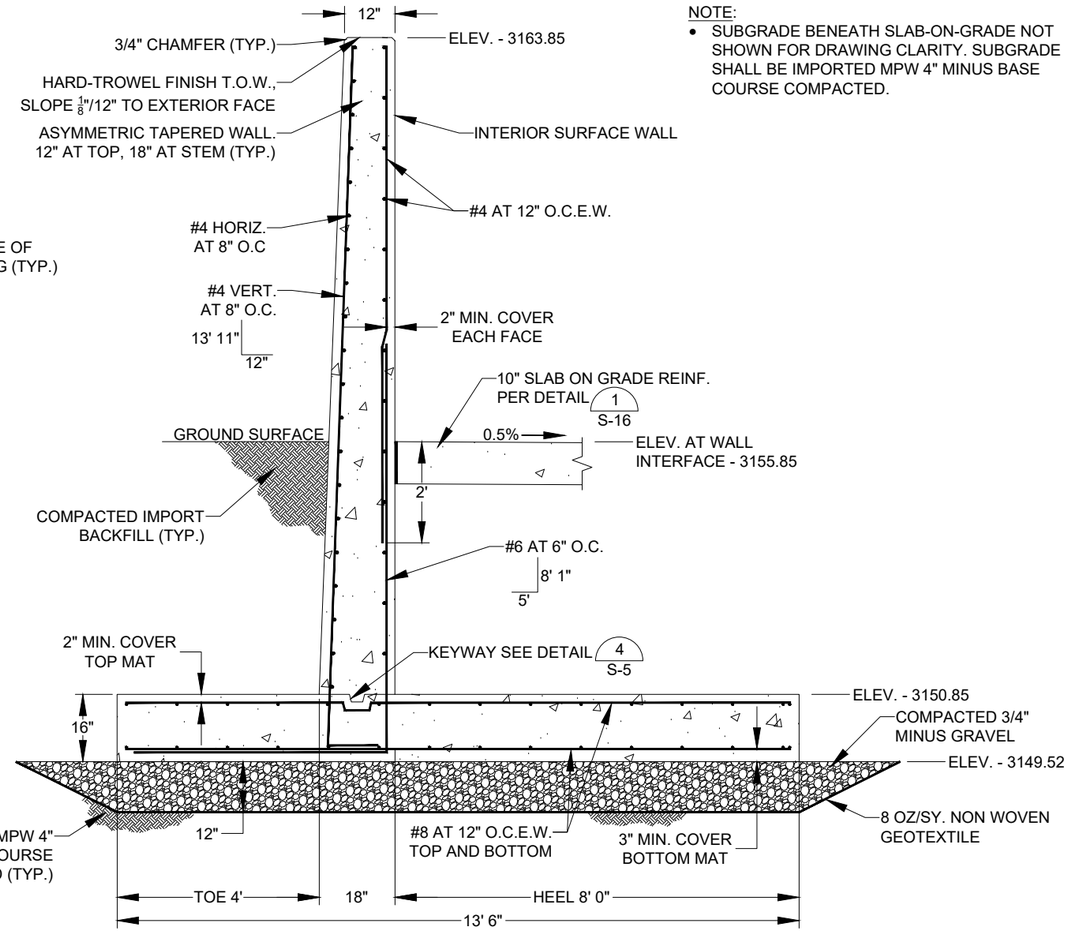


Biosolids Bin 1 C-8

3 1.5 0 3 6 Feet

N

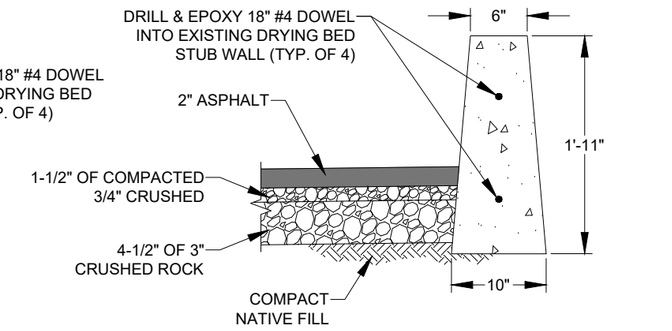
NOTE:
CAST CONCRETE FOOTING AROUND EXISTING MONITORING WELL. PLACE REBAR TO ACCOMMODATE CASING. ENSURE PROTECTION OF WELL THROUGHOUT DEMOLITION AND CONSTRUCTION.



Biosolids Bin Push Wall Section A S-13

1.5 0.75 0 1.5 3 Feet

NOTE:
- SUBGRADE BENEATH SLAB-ON-GRADE NOT SHOWN FOR DRAWING CLARITY. SUBGRADE SHALL BE IMPORTED MPW 4" MINUS BASE COURSE COMPACTED.



Existing Drying Bed Wall Section 2 S-13

NO SCALE

NOTE:
THE SOUTHEAST CORNER OF THE BIOSOLIDS BIN WILL SHARE A COMMON WALL WITH THE NORTHWEST CORNER OF THE EXISTING DRYING BED. RE-CONSTRUCT THE EFFECTED DRYING BED WALLS TO INTERSECT WITH THE BIOSOLIDS BID WALLS.

MONTANA TYLER R. JIRGES No. 87469PE LICENSED PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A. Eckhart, P.E.
Drawn By: E. Swanson
Approved By: Matt Miller, P.E.
Checked By: Tyler Jirges, P.E.
Designed By: Tyler Jirges, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

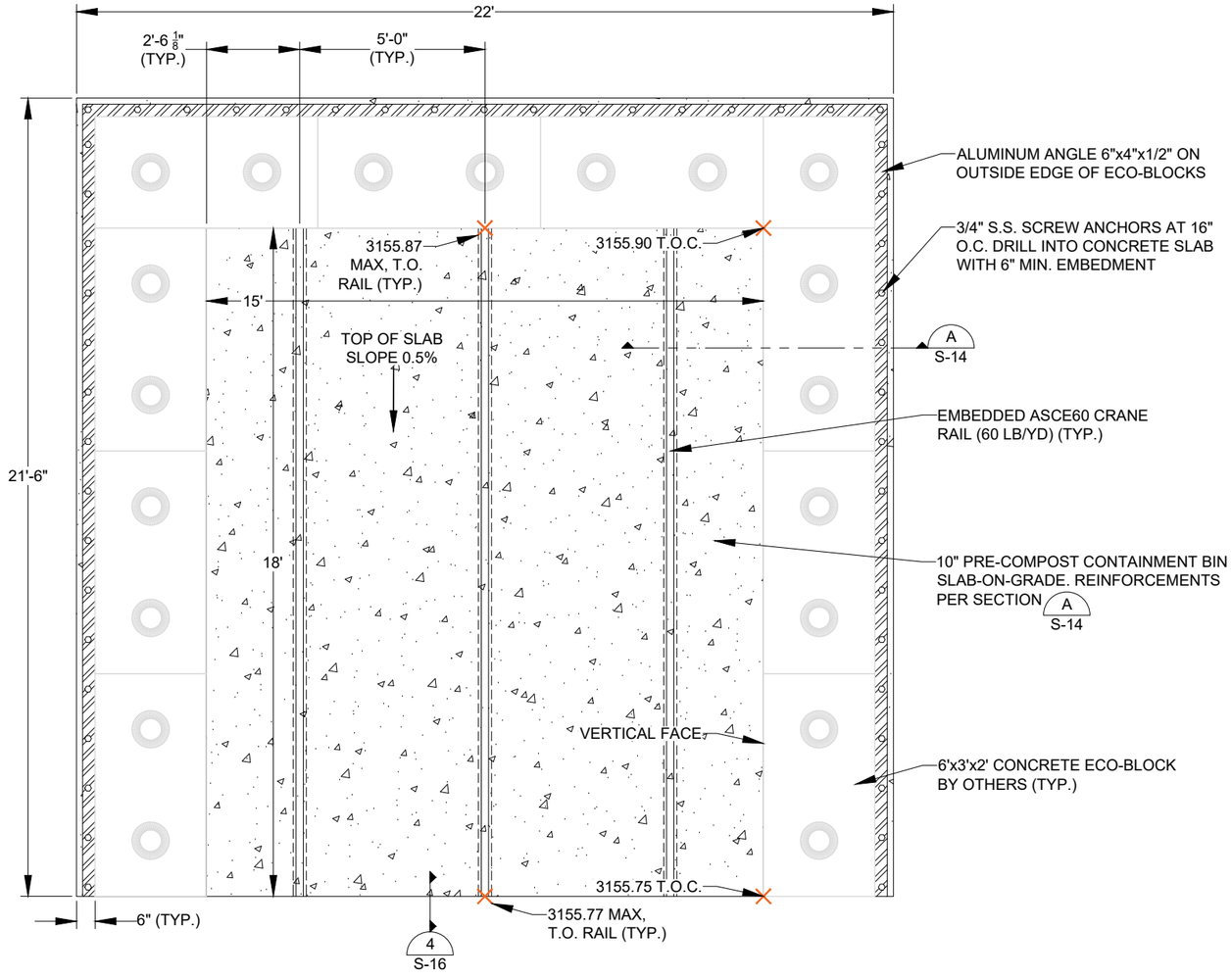
RPA
602 S. Ferguson Ave. STE 5
Bozeman, MT 59718
Phone (406) 284-2110

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

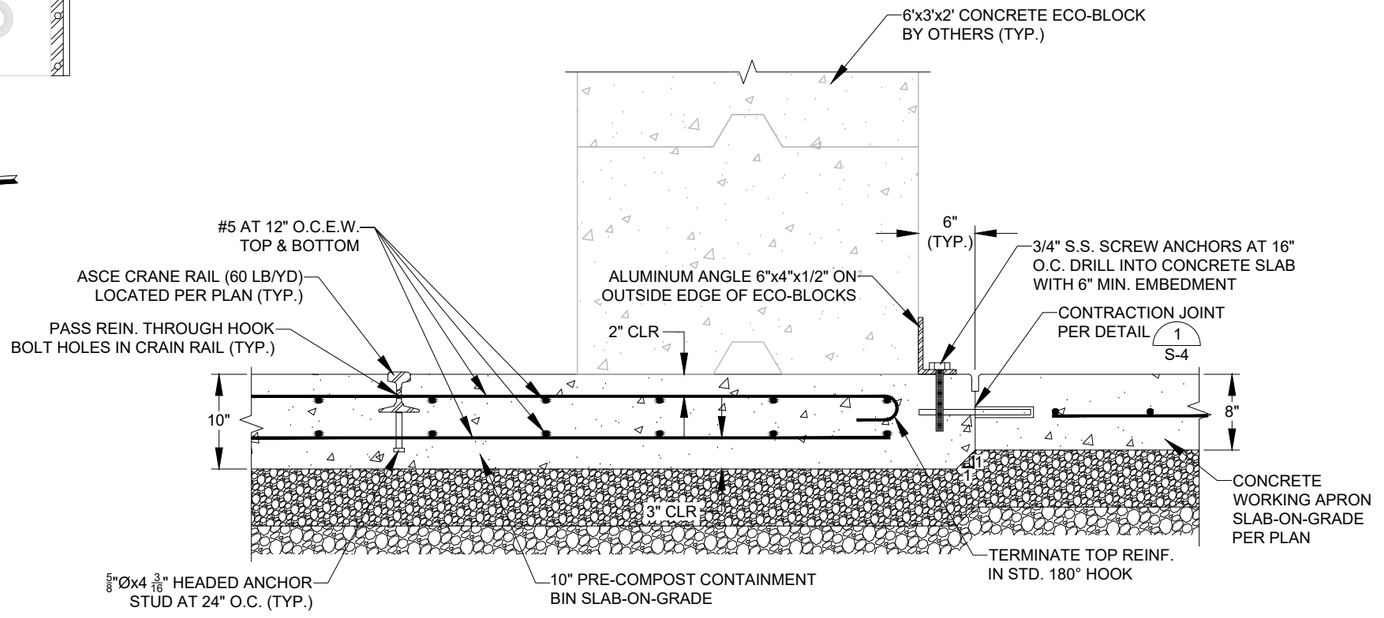
Sheet Title: **Biosolids Bin Details**

Sheet: **S-13**



Pre-Compost Containment Bin 1 C-8

2 1 0 2 4
Feet



Pre-Compost Containment Bin Section A S-14

NO SCALE

MONTANA
TYLER R. JIRGES
No. 87469 PE
LICENSED PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A. Eckhart, P.E.
Drawn By: E. Swanson
Approved By: Matt Miller, P.E.
Checked By: Tyler Jirges, P.E.
Designed By: Tyler Jirges, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

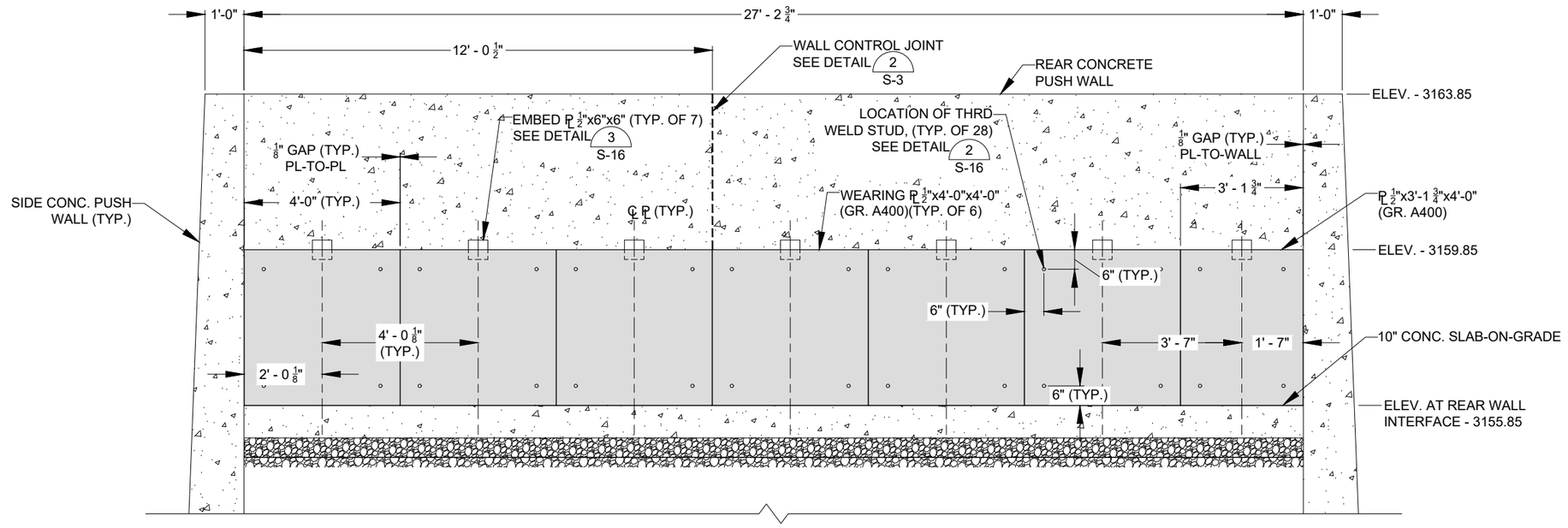
RPA
602 S. Ferguson Ave. STE 5
Bozeman, MT 59718
Phone (406) 284-2110

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Pre-Compost Containment Bin Slab Details**

Sheet: **S-14**



Biosolids Bin Rear Push Wall Elevation

1
S-15

NO SCALE

MONTANA
TYLER R. JIRGES
No. 87469 PE
LICENSED PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A. Eckhart, P.E.
Drawn By: E. Swanson
Approved By: Matt Miller, P.E.
Checked By: Tyler Jirges, P.E.
Designed By: Tyler Jirges, P.E.

Engineer
Anderson~Montgomery
CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

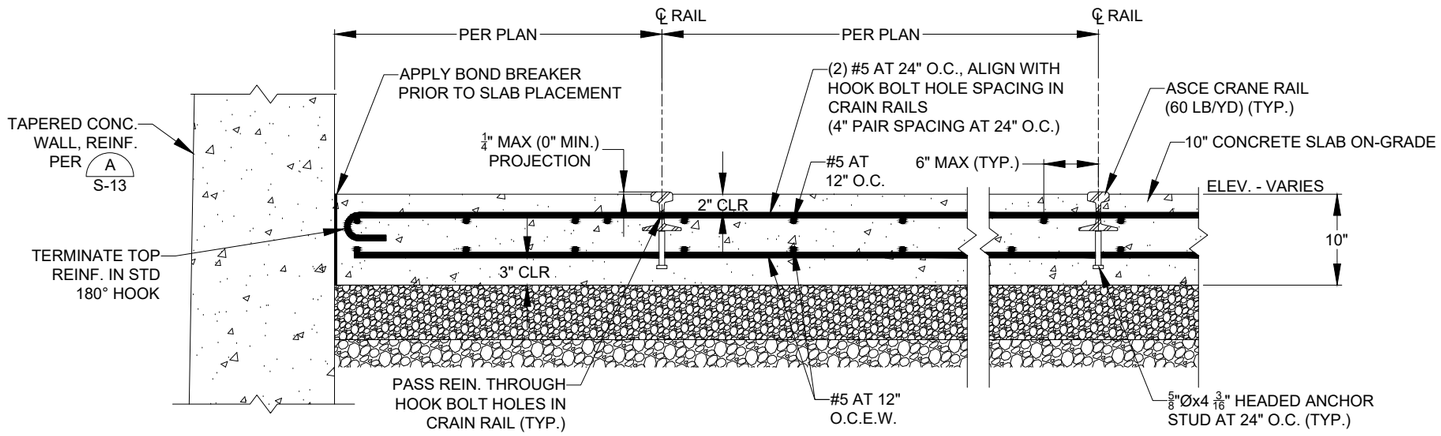
RPA
602 S. Ferguson Ave. STE 5
Bozeman, MT 59718
Phone (406) 284-2110

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

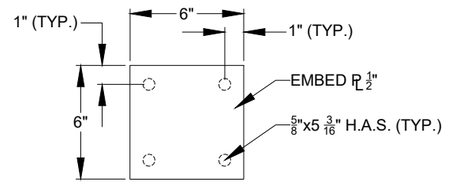
Sheet Title: **Biosolids Bin Wall Elevations**

Sheet: **S-15**

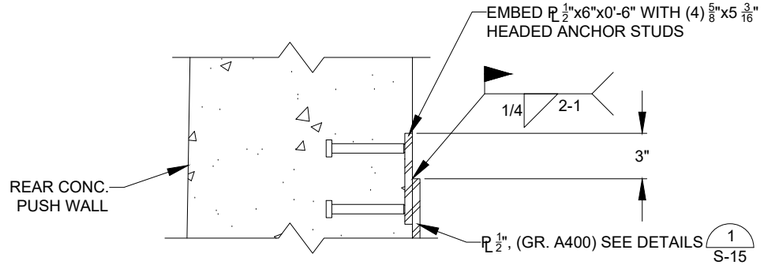


Biosolids Slab Section (1 / S-16)

NO SCALE

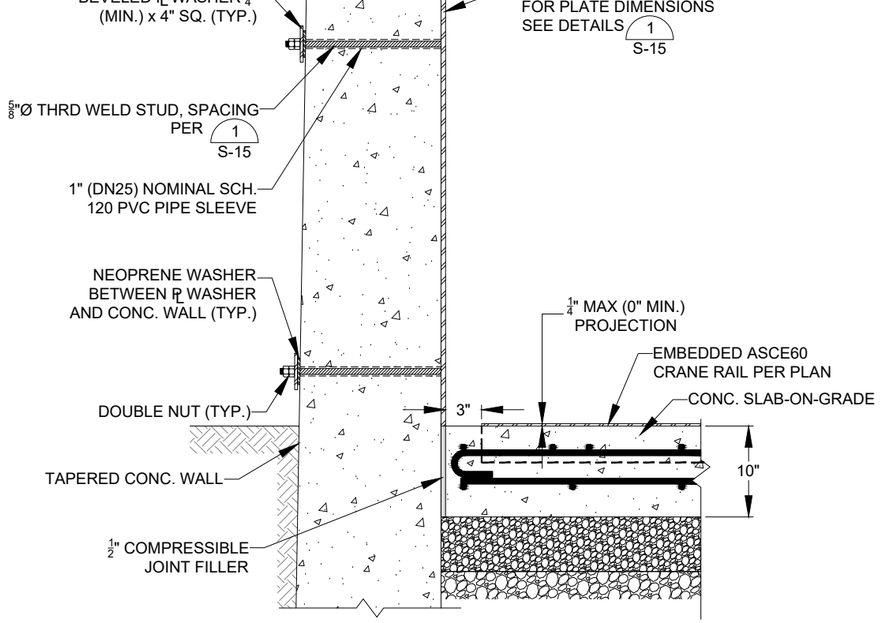


EMBED PLATE ELEVATION



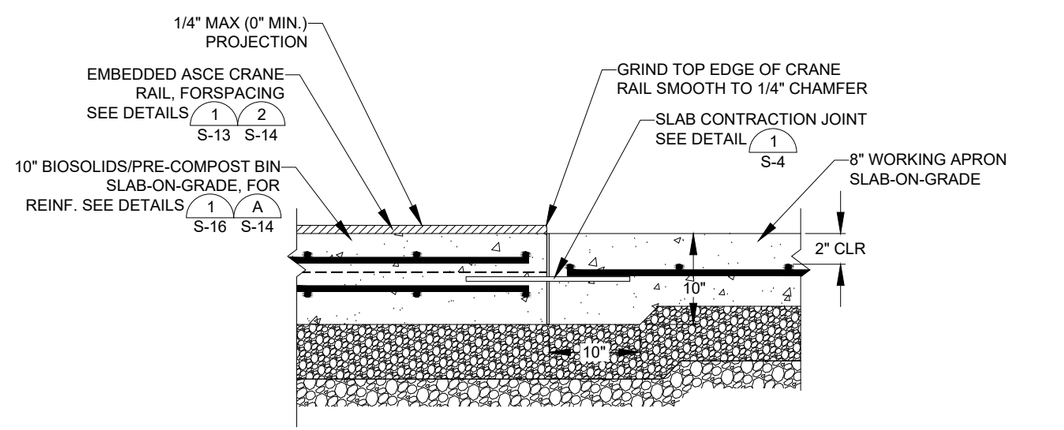
Biosolids Bin Embed Plate Detail (3 / S-16)

NO SCALE



Biosolids Backwall Plate Detail (2 / S-16)

NO SCALE



Biosolids/Pre-Compost Bin Contraction Joint At Working Apron Slab (4 / S-16)

NO SCALE

Revision	Date	By
Final	4/2/25	AE
Re-Scope	5/7/25	AE

Revision: Re-Scope
Plot Scale: 1:2
Drawn By: A. Eckhart, P.E.
Drawn By: E. Swanson
Approved By: Matt Miller, P.E.
Checked By: Tyler Jirges, P.E.
Designed By: Tyler Jirges, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303
RPA
602 S. Ferguson Ave. STE 5
Bozeman, MT 59718
Phone (406) 284-2110

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **Biosolids & Pre-Compost Mixing Bin Details**

Sheet: **S-16**

PANEL SCHEDULE					LOCATION: SOURCE: MOUNTING:				AIC RATING: 14K SURFACE				PANEL NAME: MDP
CKT		BREAKER		REF.	LOAD TYPE (VA)								
NO.	DESCRIPTION	AMP	POLE	NOTE	LTG.	REC'S	MOTOR	EQUIP	HEATING	COOLING	VA	AMPS	PANEL DATA
1	SPARE	60	3									0.0	AMPERAGE: 400
3	-	**	*									0.0	VOLTAGE: 277/480
5	-	**	*									0.0	PHASE: 3
7	SPARE	20	3									0.0	WIRE: 4
9	-	**	*									0.0	MAINS REF. NOTE
11	-	**	*									0.0	OCT. BKR. 400A MCB
13	LIFT STATION	30	3				4,210				4,210	15.2	LUGS ONLY -
15	-	**	*				4,210				4,210	15.2	GROUND BUSS
17	-	**	*				4,210				4,210	15.2	EQUIPMENT: YES
19	PANEL C1	40	2		300	360	1,440	550	0	0	2,650	9.6	ISOLATED: -
21		**	*		0	1,080	1,440	2,400	0	0	4,920	17.8	NEUTRAL BUSSING
23	SPARE	20	1								0	0.0	100% YES
25	SPARE	20	3								0	0.0	200% -
27	-	**	*								0	0.0	BUSSING
29	-	**	*								0	0.0	COPPER: YES
											0	0.0	ALUMINUM: -
											0	0.0	TOP FEED: -
											0	0.0	BOTTOM FEED: -
											0	0.0	FEED THRU LUGS: -
											0	0.0	SUB FEED LUGS: -
											0	0.0	CONNECTED TOTALS
											0	0.0	(INCLUDES FEED-THRU CONTRIBUTION)
													LOAD KVA AMPS
2	BAY 1-6 DRIVE CABINET	100	3				18,268				18,268	65.9	LIGHTING: 0.3 0.4
4	-	**	*				18,268				18,268	65.9	RECEPTACLES: 1.4 1.7
6	-	**	*				18,268				18,268	65.9	MOTOR: 253.0 304.3
8	BAY 7-12 DRIVE CABINET	100	3				18,268				18,268	65.9	EQUIPMENT: 3.0 3.5
10	-	**	*				18,268				18,268	65.9	HEATING: 0.0 0.0
12	-	**	*				18,268				18,268	65.9	COOLING: 0.0 0.0
14	BIOFILTER DRIVE CABINET	225	3				42,627				42,627	153.9	
16	-	**	*				42,627				42,627	153.9	TOTALS 257.7 310.0
18	-	**	*				42,627				42,627	153.9	
20	225/3 SPACE										0	0.0	PHASE KVA AMPS
22	-										0	0.0	A: 86.0 310.6
24	-										0	0.0	B: 88.3 318.7
26	225/3 SPACE										0	0.0	C: 83.4 301.0
28	-										0	0.0	TOTAL 257.7
30	-										0	0.0	
											0	0.0	FEEDER DEMAND TOTALS
											0	0.0	LOAD KVA AMPS
											0	0.0	LIGHTING: 0.4 0.5
											0	0.0	RECEPTACLES: 1.4 1.7
											0	0.0	MOTOR: 253.0 304.3
											0	0.0	EQUIPMENT: 3.0 3.5
											0	0.0	HEAT/COOL: 0.0 0.0
													LARGEST MOTOR: 0.0
													TOTAL 257.8 310.0
													DATE: 05/29/25

REFERENCE NOTES:
1
2
3
4

PANEL SCHEDULE					LOCATION: SOURCE: MOUNTING:				AIC RATING: 10,000 SURFACE				PANEL NAME: C1
CKT		BREAKER		REF.	LOAD TYPE (VA)								
NO.	DESCRIPTION	AMP	POLE	NOTE	LTG.	REC'S	MOTOR	EQUIP	HEATING	COOLING	VA	AMPS	PANEL DATA
1	SPARE	20	1								0	0.0	AMPERAGE: 100
3	RECEPTACLES	20	1			720					720	6.0	VOLTAGE: 120/240
5	RECEPTACLES	20	1			360					360	3.0	PHASE: 1
7	DATA RACK	20	1			360					360	3.0	WIRE: 3
9	BLOWER PANEL CONTROLS	20	1					200.00			200	1.7	MAINS REF. NOTE
11	BLOWER PANEL CONTROLS	20	1					200.00			200	1.7	OCT. BKR. 100 AMP MCB
13	BLOWER PANEL CONTROLS	20	1					200.00			200	1.7	LUGS ONLY
15	SPARE	20	1								0	0.0	GROUND BUSS
17	IRRIGATION WELL PUMP	25	2				1,440				1,440	12.0	EQUIPMENT: YES
19	-	**	*				1,440				1,440	12.0	ISOLATED: -
21	SPACE										0	0.0	NEUTRAL BUSSING
23	SPACE										0	0.0	100% YES
											0	0.0	200% -
											0	0.0	BUSSING
											0	0.0	COPPER: -
											0	0.0	ALUMINUM: YES
											0	0.0	TOP FEED: -
											0	0.0	BOTTOM FEED: -
											0	0.0	FEED THRU LUGS: -
											0	0.0	SUB FEED LUGS: -
											0	0.0	CONNECTED TOTALS
											0	0.0	(INCLUDES FEED-THRU CONTRIBUTION)
													LOAD KVA AMPS
2	LIGHTING	20	1		300						300	2.5	LIGHTING: 0.3 1.3
4	GENERATOR BLOCK HEATER	20	1					1,200			1,200	10.0	RECEPTACLES: 1.4 6.0
6	GENERATOR BATTERY CHARGER	20	1					150			150	1.3	MOTOR: 2.9 12.0
8	AC UNIT	30	2								0	0.0	EQUIPMENT: 3.0 12.3
10	-	**	*								0	0.0	HEATING: 0.0 0.0
12	PLC PANEL	20	1					1,000			1,000	8.3	COOLING: 0.0 0.0
14	SPARE	20	1								0	0.0	
16	SPARE	20	1								0	0.0	TOTALS 7.6 31.5
18	SPACE										0	0.0	
20	SPACE										0	0.0	PHASE KVA AMPS
22	SPACE										0	0.0	A: 2.7 22.1
24	SPACE										0	0.0	B: 4.9 41.0
26											0	0.0	
28											0	0.0	TOTAL 7.6
30											0	0.0	
32											0	0.0	FEEDER DEMAND TOTALS
34											0	0.0	LOAD KVA AMPS
36											0	0.0	LIGHTING: 0.4 1.6
38											0	0.0	RECEPTACLES: 1.4 6.0
40											0	0.0	MOTOR: 2.9 12.0
42											0	0.0	EQUIPMENT: 3.0 12.3
													HEAT/COOL: 0.0 0.0
													LARGEST MOTOR: 0.0
													TOTAL 7.6 31.9
													DATE: 06/05/25

REFERENCE NOTES:
1
2

LIGHTING FIXTURE SCHEDULE

		FIXTURE				MOUNTING	
TYPE	DESCRIPTION	MFG.	CATALOG NUMBER	VOLTS	WATTS	TYPE	HEIGHT
L1	4000 LUMEN 4FT LED STRIP LIGHT	LITHONIA	CSS-L48-4000LM-MVOLT-40K-80CRI	120/277V	35.3	SURFACE	CEILING
W1	LED WALL LIGHT WITH PHOTOCELL	LITHONIA	WPX1-LED-PZ-40K-MVOLT-DDBXD-M4	120/277V			

LEGEND

SYMBOL	ABBREVIATIONS & MISCELLANEOUS
a,b,c etc.	SWITCH DESIGNATION
AC	ABOVE COUNTER
AFF	ABOVE FINISHED FLOOR
AG	ABOVE GROUND
BN1L-2,4,6	CIRCUIT DESIGNATION, PANELBOARD BN1L, CIRCUITS 2, 4, 6
BOD	BOTTOM OF DEVICE
C	CONDUIT
COD	CENTER OF DEVICE
(E)	EXISTING
EC	ELECTRICAL CONTRACTOR
GC	GENERAL CONTRACTOR
GND	GROUND
GFI	GROUND FAULT CIRCUIT INTERRUPTER
MC	MECHANICAL CONTRACTOR
MTS	MANUAL TRANSFER SWITCH
(N)	NEW
NL	NIGHT LIGHT
NWE	NORTHWESTERN ENERGY
UG	UNDERGROUND
W/	WITH
WP	WEATHER PROOF
1/E5.2	INDICATES DETAIL 1 ON SHEET E5.2
1	SHEET WORK NOTE
	HOME RUN TO PANELS
	CONDUIT CONCEALED IN CEILING OR WALL
	CONDUIT CONCEALED UNDER FLOOR
///	CIRCUIT, NUMBER OF HASH MARKS INDICATES NUMBER OF CONDUCTORS IN CABLE/RACEWAY. GROUND WIRE NOT SHOWN BUT SHALL BE INCLUDED. NO HASH MARKS INDICATES 2 CONDUCTORS PLUS GROUND.

SYMBOL	LIGHTING
	PENDANT OR SURFACE MOUNTED FLUORESCENT LIGHT FIXTURE, SIZE ON PLANS
	2 HEAD EMERGENCY LIGHT BATTERY PACK

SYMBOL	COMMUNICATIONS
	DATA JACK, (1) CAT 6 JACK

SYMBOL	DEVICES & POWER
$	SWITCH - SPST 3 THREE WAY 4 FOUR WAY C CALL IN D DIMMER K KEY OPERATED LV LOW VOLTAGE MC SPDT-MOMENTARY CONTACT MLV SPDT-LOW VOLTAGE, MOMENTARY CONTACT OS OCCUPANCY SENSOR P PILOT LIGHT WP WEATHERPROOF
	RECEPTACLE - SIMPLEX
	RECEPTACLE - DUPLEX
	GFI RECEPTACLE - DUPLEX (GROUND FAULT INTERRUPT) D DEVICE RECEPT W/2 USB PORTS DC DROP CORD WP WEATHERPROOF TR TAMPER RESISTANT S SURGE PROTECTED IG ISOLATED GROUND FILLED CENTER INDICATES HOSPITAL GRADE EMERGENCY RECEPTACLE
	RECEPTACLE - DOUBLE DUPLEX GFI RECEPTACLE - DOUBLE DUPLEX - SAME INDICATORS AS SHOWN FOR DUPLEX
	RECEPTACLE - 208V D DRYER R RANGE W WELDER * NEMA CONFIGURATION AS NOTED
	FLOOR 208V RECEPTACLE
	FLOOR DUPLEX RECEPTACLE
	FLOOR DOUBLE DUPLEX RECEPTACLE
J HJ	J-BOX, J-BOX WALL MOUNTED, 4"x4"x2 1/8 " DEEP UNLESS NOTED OTHERWISE
PP	POWER POLE
T	THERMOSTAT BY MC, INSTALLED AND CONNECTED BY EC
T	THERMOSTAT BY MC, J-BOX & CONDUIT TO CEILING BY EC
$M	MANUAL MOTOR DISCONNECT/STARTER SWITCH
PB	PUSHBUTTON SWITCH SUPPLIED BY OTHERS, INSTALLED AND CONNECTED BY EC
DS	DOOR SWITCH SUPPLIED BY OTHERS, INSTALLED AND CONNECTED BY EC
TS	REMOTE TEST SWITCH
PP	POWER PACK
OS	OCCUPANCY SENSOR
	EMERGENCY PUSHBUTTON
R	RELAY
PC	PHOTOCELL
HPC	PHOTOCELL, WALL MOUNTED
	SPECIAL PURPOSE CONNECTION, BOX INDICATES FLOOR MOUNTING, WORK AS NOTED
M	ELECTRIC MOTOR CONNECTION
	COMBINATION STARTER
	DISCONNECT SWITCH
	CONTACTOR
	CIRCUIT BREAKER
VFD	VARIABLE FREQUENCY DRIVE
	EXISTING PANELBOARD, SURFACE MOUNTED
	EXISTING PANELBOARD, FLUSH MOUNTED
	PANELBOARD, SURFACE MOUNTED
	PANELBOARD, FLUSH MOUNTED
	TRANSFORMER, DRY-TYPE
T	TRANSFORMER, PAD MOUNTED
	ELECTRIC METER, BUILDING MOUNTED
RC	ROOM CONTROLLER
XXX.X	FEEDER ID TAG

GENERAL NOTES (APPLICABLE TO ALL SHEETS)

1. ALTHOUGH NOT SHOWN, ALL RACEWAYS SHALL BE EQUIPPED WITH AN EQUIPMENT GROUNDING CONDUCTOR.
2. THE CONDUCTOR SIZE CALLED OUT IN THE HOME RUN SHALL BE CARRIED THROUGHOUT THE ENTIRE CONDUIT.
3. DRAWINGS INDICATE GENERAL DIRECTIONS AND ROUTES OF FEEDERS, BRANCH CIRCUITS, AND SERVICE CONDUCTOR SYSTEMS. DETERMINE EXACT ROUTE AND INSTALLATION OF ELECTRICAL WIRING WITH CONDITIONS OF CONSTRUCTION.
4. PRIOR TO ROUGH-IN, COORDINATE EXACT LOCATIONS OF ALL DEVICES AND EQUIPMENT WITH ARCHITECTURAL ELEVATIONS, MILLWORK, REFLECTED CEILING PLAN, AND MECHANICAL EQUIPMENT.
5. OUTLET BOXES SHALL NOT BE MOUNTED BACK TO BACK. MAINTAIN MINIMUM LATERAL SEPARATIONS OF 24".
6. ALL EXISTING CONDITIONS ARE NOT SHOWN ON THE DRAWINGS. CONTRACTOR SHALL CAREFULLY EXAMINE THE EXISTING SITE AND BECOME FAMILIAR WITH THE EXISTING CONDITIONS. NO ADDITIONAL CHARGES WILL BE ALLOWED DUE TO THE LACK OF PRE-BID SITE EXAMINATION.
7. THE EXACT LOCATION OF ELECTRICAL EQUIPMENT SHALL BE COORDINATED WITH STRUCTURE AND MECHANICAL EQUIPMENT. ADJUST EQUIPMENT LOCATION AS REQUIRED TO MAINTAIN NEC WORKING CLEARANCES.
8. ALL SPARE CONDUIT SHALL CONTAIN A PULL CORD. EACH END OF THE CONDUIT SHALL HAVE A LABEL IDENTIFYING THE TERMINATION POINT OF THE OPPOSITE END OF THE CONDUIT.
9. COORDINATE EXACT LOCATION OF ALL WALL MOUNTED VOICE/DATA OUTLETS WITH POWER OUTLETS. ADJUST LOCATION OF ALL VOICE DATA OUTLETS SO THAT THEY ARE LOCATED AT THE SAME ELEV. AND OFFSET HORIZONTALLY 6".
10. CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL EXISTING UNDERGROUND UTILITIES PRIOR TO EXCAVATION. ANY DAMAGE TO THE EXISTING UTILITIES SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE.
11. ALL CIRCUITS SHALL CONTAIN A DEDICATED NEUTRAL CONDUCTOR. SHARED NEUTRAL CONDUCTOR IS NOT ALLOWED.
12. CONTRACTOR IS RESPONSIBLE FOR ALL TRENCHING, PATCHING, EXCAVATION, BACKFILL AND RESTORATION RELATED TO THEIR WORK.

MONTANA ALAN BRONEC 11707 PE REGISTERED PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AB
Re-Scope	5/7/25	AB

Revision: Re-Scope
Plot Scale: 1:1
Drawn By: S.Galli
Approved By: A.Bronec, P.E.
Checked By: A.Bronec, P.E.
Designed By: A.Bronec, P.E.

Engineer

Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Cushing Terrell
306 Railroad St.
Missoula, MT 59802
Phone (406) 544-8565

Owner
City Of Missoula

Project Title
Garden City Compost Facility Improvements

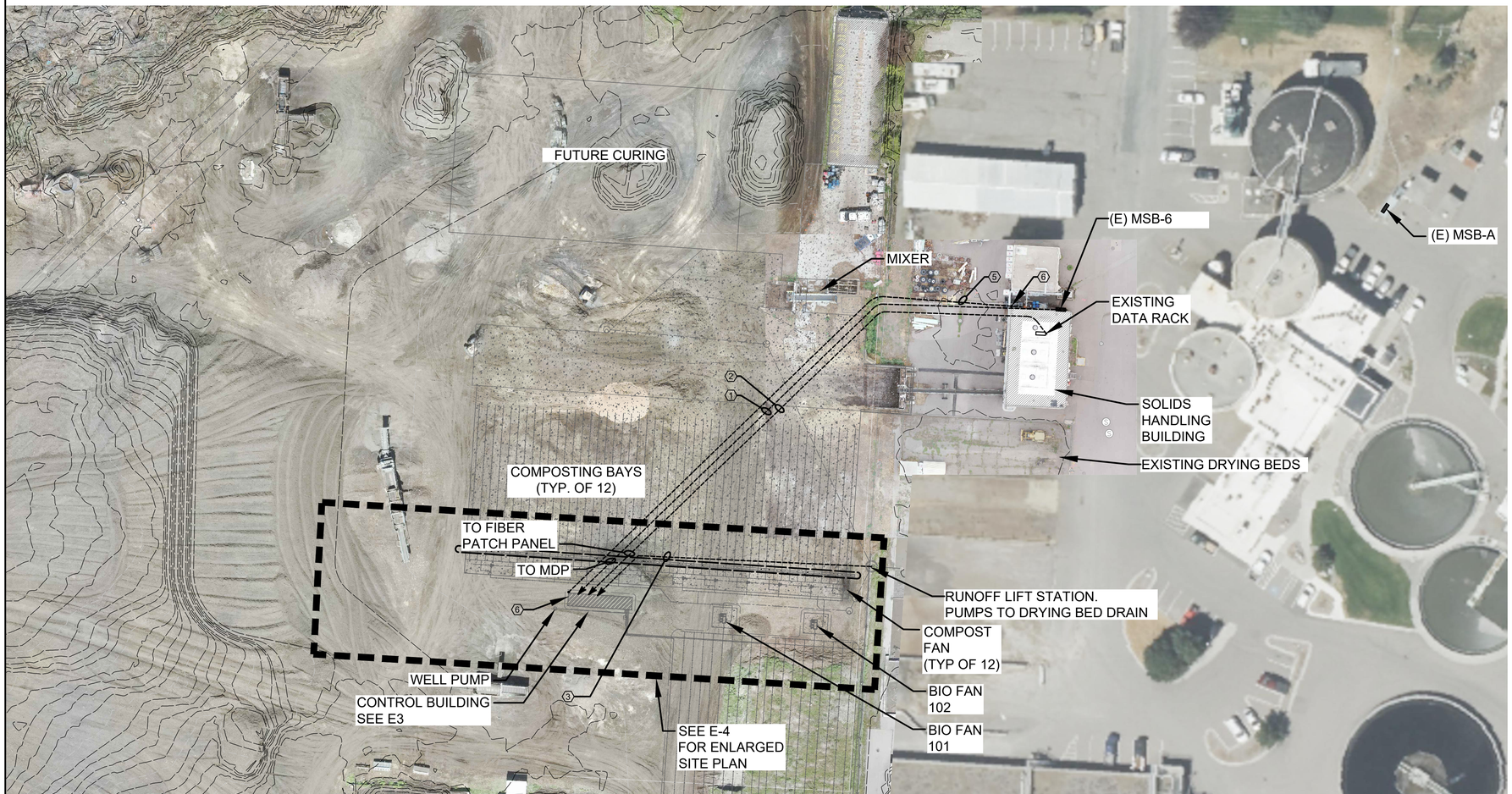
Sheet Title
SCHEDULES AND LEGEND

Sheet
E-0

L:\MSLA_COMPOST\BIMCAD\Elec\MSST_E-0.dwg SAVED: 5/29/25 PRINTED: 6/5/25 BY: TYLERREOPELLE

KEY NOTES

1. 4" CONDUIT FOR FEEDER FROM MSB-A TO MDP. SEE ONE-LINE DIAGRAM E-2.
2. 3" CONDUIT WITH FIBER FROM PLC IN CONTROL BUILDING TO DATA RACK IN SOLIDS HANDLING BUILDING.
3. LIFT STATION FEEDER TO MDP. SEE ONE-LINE DIAGRAM E-2.
4. NOT USED
5. PROVIDE (1) 3" SPARE CONDUIT WITH PULL CORD.
6. STUB UP AND CAP SPARE CONDUIT 1 FT ABOVE GRADE.



1 / E-1 OVERALL ELECTRICAL SITE PLAN

1" = 40'-0"

N

40 20 0 40 80

Feet

MONTANA
ALAN BRONEC
11707 PE
LICENSED PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AB
Re-Scope	5/7/25	AB

Revision: Re-Scope
Plot Scale: 1:1
Drawn By: S.Galli
Approved By: A.Bronec, P.E.
Checked By: A.Bronec, P.E.
Designed By: A.Bronec, P.E.

Engineer

Anderson~Montgomery
CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Cushing Terrell
306 Railroad St.
Missoula, MT 59802
Phone (406) 544-8565

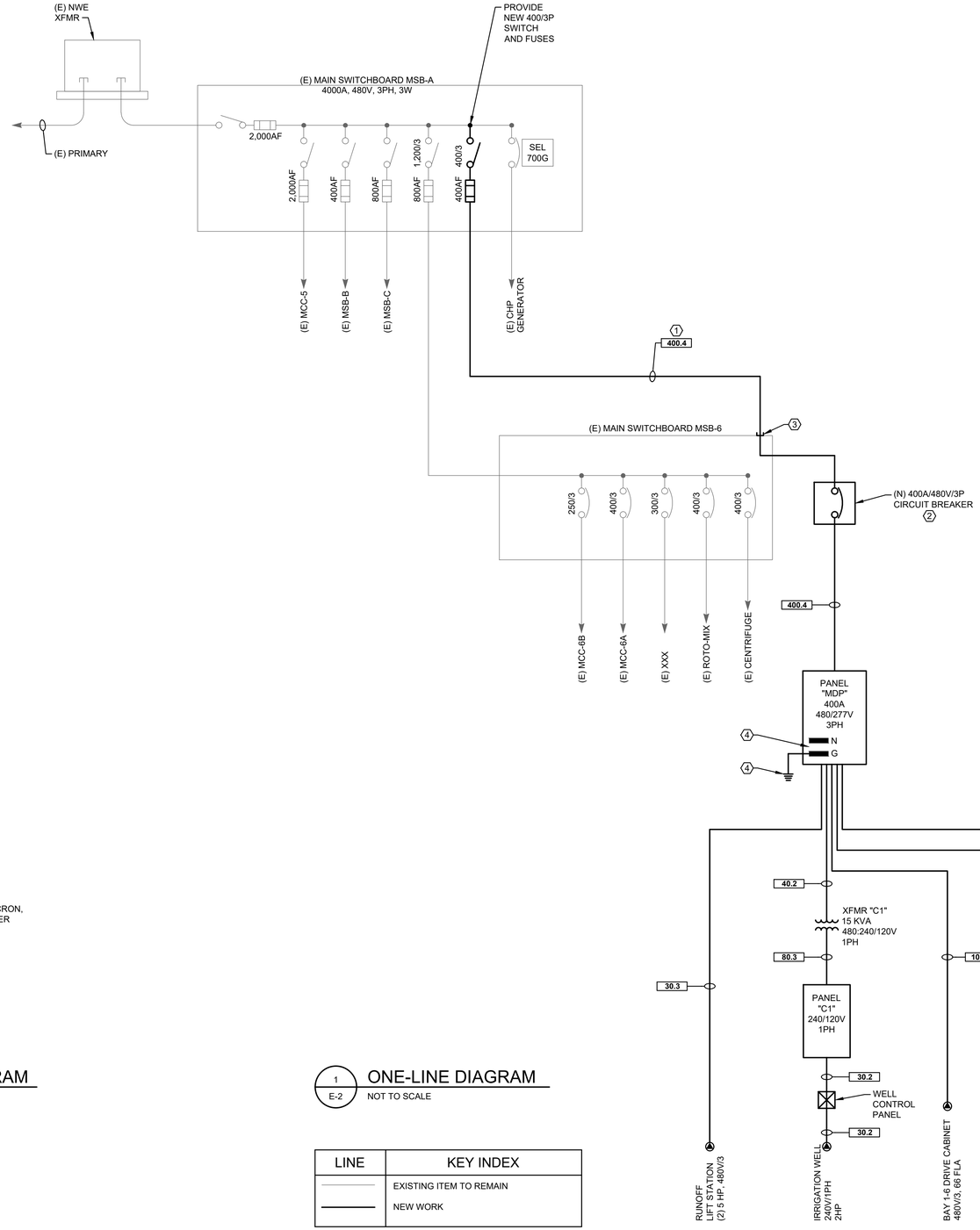
Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **OVERALL ELECTRICAL SITE PLAN**

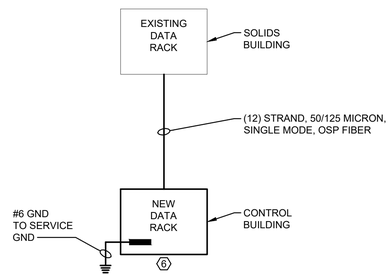
Sheet: **E-1**

COPPER FEEDER SCHEDULE XXX.X					
DESIGNATION	PARALLEL RUNS	# OF CONDUCTORS	CONDUCTOR SIZE	GROUND SIZE	SIZE OF CONDUIT
20.3	1	3	#12 CU	#12 CU	3/4"
20.4	1	4	#12 CU	#12 CU	3/4"
30.3	1	3	#10 CU	#10 CU	3/4"
30.4	1	4	#10 CU	#10 CU	3/4"
40.3	1	3	#8 CU	#10 CU	1
40.4	1	4	#8 CU	#10 CU	1"
50.3	1	3	#6 CU	#10 CU	1"
50.4	1	4	#6 CU	#10 CU	1"
60.3	1	3	#4 CU	#10 CU	1-1/4"
60.4	1	4	#4 CU	#10 CU	1-1/4"
70.3	1	3	#4 CU	#8 CU	1-1/4"
70.4	1	4	#4 CU	#8 CU	1-1/4"
80.3	1	3	#3 CU	#8 CU	1-1/4"
80.4	1	4	#3 CU	#8 CU	1-1/4"
90.3	1	3	#2 CU	#8 CU	1-1/4"
90.4	1	4	#2 CU	#8 CU	1-1/4"
100.3	1	3	#2 CU	#8 CU	1-1/4"
100.4	1	4	#2 CU	#8 CU	1-1/4"
125.3	1	3	#1 CU	#6 CU	1-1/2"
125.4	1	4	#1 CU	#6 CU	1-1/2"
150.3	1	3	1/0 CU	#6 CU	1-1/2"
150.4	1	4	1/0 CU	#6 CU	1-1/2"
175.3	1	3	2/0 CU	#6 CU	2"
175.4	1	4	2/0 CU	#6 CU	2"
200.3	1	3	3/0 CU	#6 CU	2"
200.4	1	4	3/0 CU	#6 CU	2"
225.3	1	3	4/0 CU	#4 CU	2-1/2"
225.4	1	4	4/0 CU	#4 CU	2-1/2"
250.3	1	3	250 CU	#4 CU	2-1/2"
250.4	1	4	250 CU	#4 CU	2-1/2"
300.3	1	3	350 CU	#4 CU	3"
300.4	1	4	350 CU	#4 CU	4"
350.3	2	3	500 CU	#3 CU	4"
350.4	2	4	500 CU	#3 CU	4"
400.3	2	3	3/0 CU	#3 CU	2"
400.4	2	4	3/0 CU	#3 CU	2"
450.4	2	4	4/0 CU	#2 CU	2-1/2"
500.4	2	4	250 CU	#2 CU	2-1/2"
600.4	2	4	350 CU	#1 CU	3"



1 E-2 ONE-LINE DIAGRAM

NOT TO SCALE



2 E-2 DATA SYSTEM ONE-LINE DIAGRAM

NOT TO SCALE

LINE	KEY INDEX
———	EXISTING ITEM TO REMAIN
———	NEW WORK

KEY NOTES

1. ROUTE NEW FEEDER IN EXISTING SPARE CONDUIT.
2. ENCLOSED CIRCUIT BREAKER SHALL BE 400A/3P/480V, 14K AIC, NEMA 3R ENCLOSURE, MOUNT ADJACENT TO MSB-6.
3. EXISTING SPARE CONDUIT STUBS UP INSIDE MSB-6. EXTEND CONDUIT TO NEW 400A CIRCUIT BREAKER. PROVIDE NEW CONDUIT/CONDUCTORS BETWEEN 400A CIRCUIT BREAKER AND PANEL MDP.
4. DO NOT BOND N-G TOGETHER. PROVIDE NEC GROUNDING AS FOLLOWS:
   - (2) 3/4" X 8' COPPER CLAD DRIVEN RODS. CONNECT WITH #4 CU.
   - 20 FT LONG #4 CU IN FOOTING OF CONTROL BUILDING FOUNDATION. (UFER GROUND).
   - #4 CU BOND TO CONTROL BUILDING STEEL.
   - #4 CU BOND TO ANTENA MAST.
5. NOT USED
6. DATA RACK SHALL BE WALL MOUNTED RACK WITH CAT 6 PATCH PANEL AND FIBER PATCH PANEL. ETHERNET SWITCH TO BE PROVIDED BY CITY.

ALAN BRONEC
11707 PE
STATE OF MONTANA
LICENSED PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AB
Re-Scope	5/7/25	AB

Revision: Re-Scope
Plot Scale: 1:1
Drawn By: S.Galli
Approved By: A.Bronec, P.E.
Checked By: A.Bronec, P.E.
Designed By: A.Bronec, P.E.

Engineer
Anderson~Montgomery CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Cushing Terrell
306 Railroad St.
Missoula, MT 59802
Phone (406) 544-8565

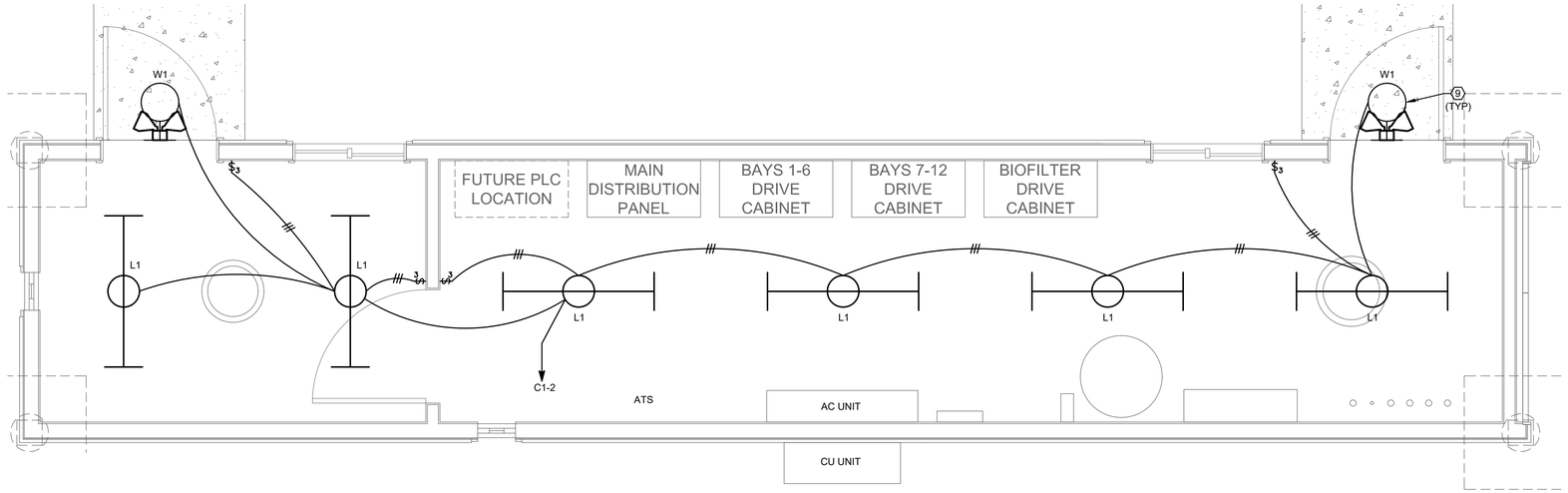
Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **ONE-LINE DIAGRAM**

Sheet: **E-2**

L:\MSLA_COMPOST\BIMCAD\Elec\MSST_E-2.dwg SAVED: 5/29/25 PRINTED: 6/5/25 BY: TYLERREOPELLE



KEY NOTES

1. NOT USED
2. NOT USED
3. NOT USED
4. NOT USED
5. PROVIDE ANTENA MAST CONSISTING OF 1.5" RIGID STEEL CONDUIT TERMINATED 10 FT ABOVE CONTROL BUILDING.
6. 1"C, (4) STRAND 50/125 MICRON, SM, CABLE TO DATA CABINET.
7. NOT USED
8. 120V CONTROL POWER. SEE ONE-LINE FOR 480V FEEDER.
9. WALL LIGHT WITH PHOTO CELL AND MOTION SENSOR.
10. NOT USED
11. NOT USED
12. NOT USED
13. NOT USED
14. NOT USED
15. PROVIDE CONNECTION TO EXHAUST FAN AND LINE VOLTAGE REVERSE ACTING T-STAT.

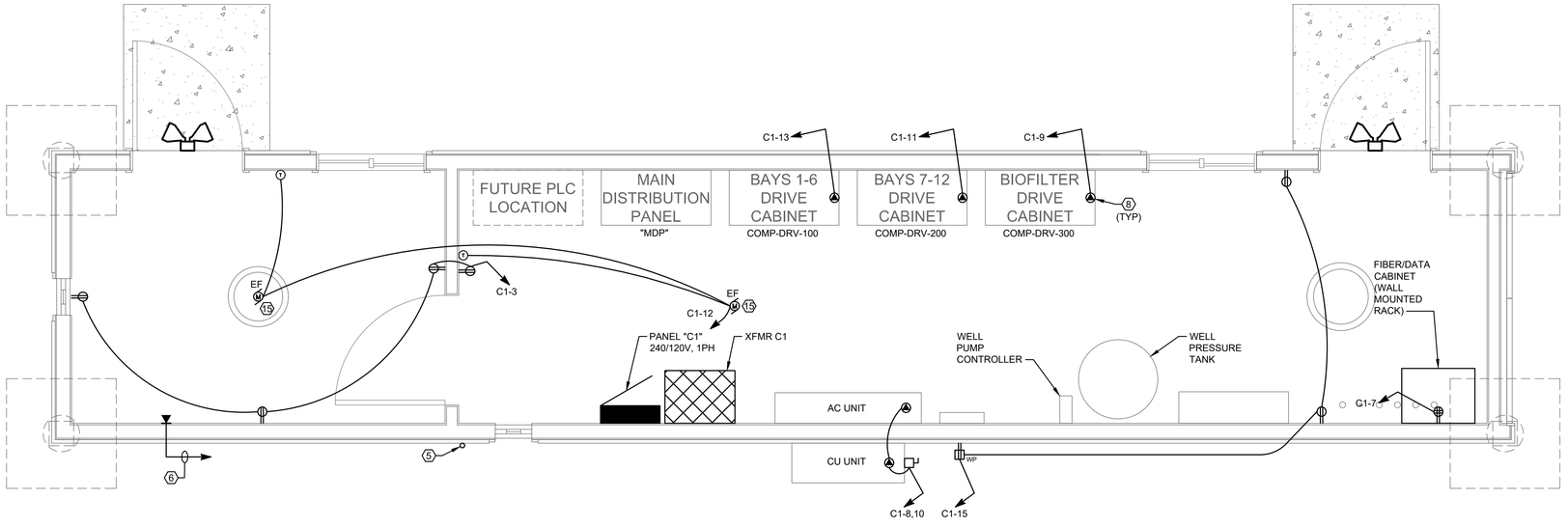
1 / E-3 LIGHTING PLAN

1/2"=1'-0"

N

0 1' 2' 4'

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



2 / E-3 POWER/DATA PLAN

1/2"=1'-0"

N

0 1' 2' 4'

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

MONTANA
ALAN BRONEC
11707 PE
REGISTERED PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AB
Re-Scope	5/7/25	AB

Revision: Re-Scope
Plot Scale: 1:1
Drawn By: S.Galli
Approved By: A.Bronec, P.E.
Checked By: A.Bronec, P.E.
Designed By: A.Bronec, P.E.

Engineer

Anderson~Montgomery
CONSULTING ENGINEERS
1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Cushing Terrell
306 Railroad St.
Missoula, MT 59802
Phone (406) 544-8565

Owner: City Of Missoula

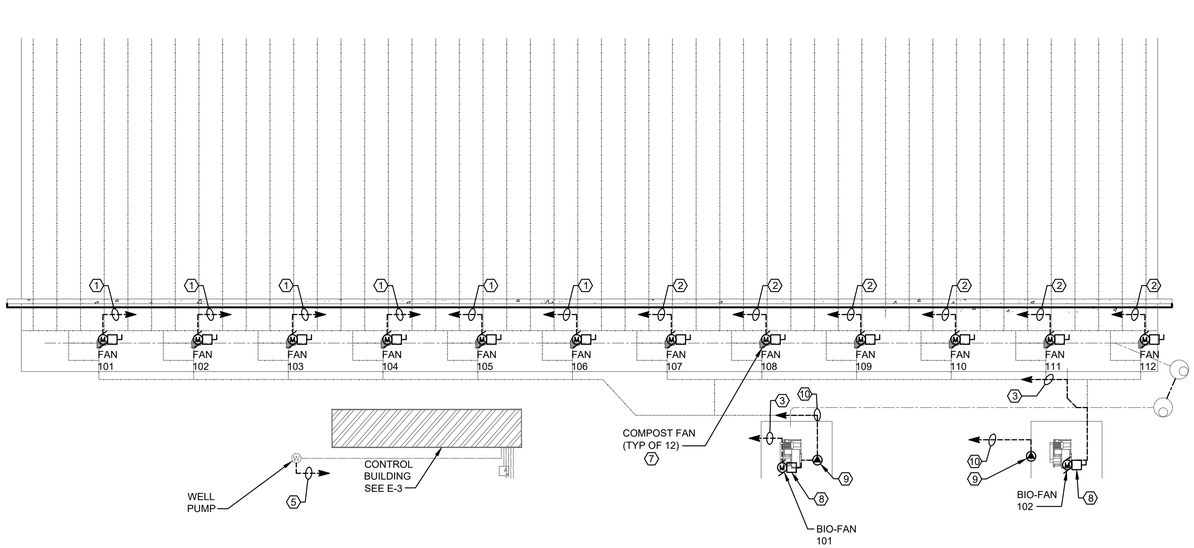
Project Title: Garden City Compost Facility Improvements

Sheet Title: **CONTROL BUILDING ELECTRICAL PLANS**

Sheet: **E-3**

KEY NOTES

1. 1"C WITH 3#10, 1#10 GND SHIELDED VFD CABLES PLUS 2 #14 SHIELD CONTROL CABLE FOR VFD SHUT DOWN SIGNAL. ROUTE TO BAY 1-6 DRIVE CABINET.
2. 1"C WITH 3#10, 1#10 GND SHIELDED VFD CABLES PLUS 2 #14 SHIELD CONTROL CABLE FOR VFD SHUT DOWN SIGNAL. ROUTE TO BAY 7-12 DRIVE CABINET.
3. 1-1/2"C WITH 3#2, 1#8 GND SHIELDED VFD CABLES PLUS 2 #14 SHIELD CONTROL CABLE FOR VFD SHUT DOWN SIGNAL. ROUTE TO BIOFILTER DRIVE CABINET.
4. NOT USED
5. TO WELL PUMP CONTROLLER. SEE ONE-LINE DIAGRAM E-1 FOR FEEDER.
6. NOT USED
7. PROVIDE 30A / 3P / NF / NEMA 3R DISCONNECT SWITCH AT EACH COMPOST FAN. DISCONNECT SWITCH SHALL INCLUDE EARLY BREAK CONTACTS FOR VFD SHUTDOWN.
8. PROVIDE 100A / 3P / NF / NEMA 3R DISCONNECT SWITCH AT EACH COMPOST FAN. DISCONNECT SWITCH SHALL INCLUDE EARLY BREAK CONTACTS FOR VFD SHUTDOWN.
9. PRESSURE AND TEMP TRANSMITTER.
10. 1"C WITH PRESSURE AND TEMP TRANSMITTER WIRING.



2 / E-4 COMPOST AND BIOFILTER ELECTRICAL PLAN

1/16" = 1'-0"

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

MONTANA — ALAN BRONEC — 11707 PE — REGISTERED PROFESSIONAL ENGINEER

Revision	Date	By
Final	4/2/25	AB
Re-Scope	5/16/25	AB

Revision: Re-Scope
Plot Scale: 1:1
Drawn By: S.Galli
Approved By: A.Bronec, P.E.
Checked By: A.Bronec, P.E.
Designed By: A.Bronec, P.E.

Engineer

Anderson~Montgomery CONSULTING ENGINEERS

1064 N. Warren
Helena, MT 59601
Phone (406) 449-3303

Cushing Terrell

306 Railroad St.
Missoula, MT 59802
Phone (406) 544-8565

Owner: City Of Missoula

Project Title: Garden City Compost Facility Improvements

Sheet Title: **COMPOST AND BIOFILTER ELECTRICAL PLAN**

Sheet: **E-4**

L:\MSLA_COMPOST\BIMCAD\Elec\MSST_E-4.dwg SAVED:5/29/25 PRINTED:6/5/25 BY:TYLERREOPELLE