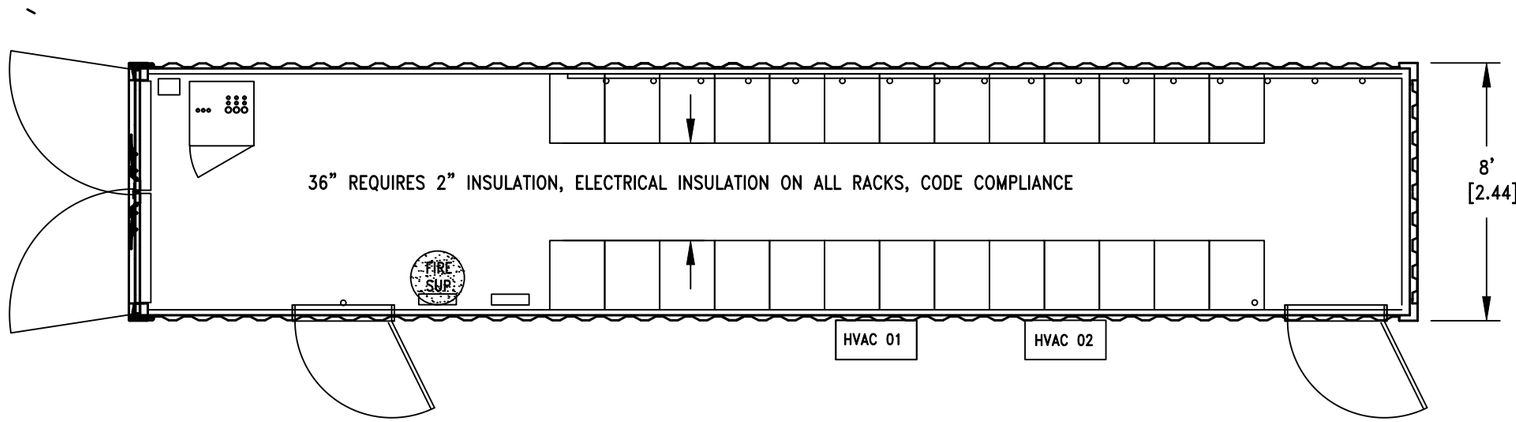
DOCKET 21-00061
NORTHERN RELIABILITY, INC. PRODUCTION, APRIL 14, 2022

Tab	Production Folder	Production File Name	Beg Bates	End Bates	Confidentiality
2	CUSTOMER INTERFACE AND ARRANGEMENTS	INST0720-B01-001 REV 1GA SKETCH 40 FOOT CONTAINER.pdf	NRI000016	NRI000016	No
7	CUSTOMER INTERFACE AND ARRANGEMENTS/Civil Engineer & Site Information	33.7 Acres	NRI000025	NRI000025	No
8	CUSTOMER INTERFACE AND ARRANGEMENTS/Civil Engineer & Site Information	201044- boundary topo 01-19-21	NRI000026	NRI000026	No
9	CUSTOMER INTERFACE AND ARRANGEMENTS/Civil Engineer & Site Information	201044 Microgrid NG 1ST DRAFT 2-1-21-more compressed	NRI000027	NRI000040	No
10	CUSTOMER INTERFACE AND ARRANGEMENTS/Civil Engineer & Site Information	201044 Microgrid NG 1ST DRAFT 2-1-21	NRI000041	NRI000054	No
11	CUSTOMER INTERFACE AND ARRANGEMENTS/Civil Engineer & Site Information	201044 Microgrid NG REVISION 3-29-21	NRI000055	NRI000071	No
12	CUSTOMER INTERFACE AND ARRANGEMENTS/Civil Engineer & Site Information	GPS location	NRI000072	NRI000072	No
13	CUSTOMER INTERFACE AND ARRANGEMENTS/Civil Engineer & Site Information	Hunt-Jackson Veg	NRI000073	NRI000077	No
14	CUSTOMER INTERFACE AND ARRANGEMENTS/Civil Engineer & Site Information	microgrid 12-14-20-PRELIM LAYOUT C-200 markup	NRI000078	NRI000078	No
15	CUSTOMER INTERFACE AND ARRANGEMENTS/Civil Engineer & Site Information	Roosevelt - Assessor Data	NRI000079	NRI000079	No
16	CUSTOMER INTERFACE AND ARRANGEMENTS/Civil Engineer & Site Information	Roosevelt - Showing Trunk Lines	NRI000080	NRI000080	No
17	CUSTOMER INTERFACE AND ARRANGEMENTS/Civil Engineer & Site Information	Roosevelt Neighborhood Topo Map	NRI000081	NRI000081	No
18	CUSTOMER INTERFACE AND ARRANGEMENTS/Civil Engineer & Site Information	Roosevelt Parcel 20200610_11521811246_28_Soil_Map	NRI000082	NRI000084	No
19	CUSTOMER INTERFACE AND ARRANGEMENTS/Civil Engineer & Site Information	Roosevelt Topo Map	NRI000085	NRI000085	No
20	CUSTOMER INTERFACE AND ARRANGEMENTS/Civil Engineer & Site Information	TN - Civil Engineer	NRI000086	NRI000086	No
23	CUSTOMER INTERFACE AND ARRANGEMENTS/Electric Cooperative Bylaws & Legal	Bylaws for Community Services Cooperative of Jackson I v1	NRI000089	NRI000113	No
24	CUSTOMER INTERFACE AND ARRANGEMENTS/Electric Cooperative Bylaws & Legal	Bylaws for Community Services Cooperative of Jackson I v1-2	NRI000114	NRI000137	No
26	CUSTOMER INTERFACE AND ARRANGEMENTS/General Project Information - Studies - Finance	Handout - New Roosevelt Parkway Solar Microgrid	NRI000169	NRI000169	No
29	CUSTOMER INTERFACE AND ARRANGEMENTS/General Project Information - Studies - Finance	Request for a Proposal	NRI000197	NRI000198	No

Tab	Production Folder	Production File Name	Beg Bates	End Bates	Confidentiality
30	CUSTOMER INTERFACE AND ARRANGEMENTS/General Project Information - Studies - Finance	RFP for Funding v14	NRI000199	NRI000208	No
33	CUSTOMER INTERFACE AND ARRANGEMENTS/Krebs and Lansing	East Jackson Tennessee_27600 Modules at 25° Tilt_10' row to row spacing_101520	NRI000222	NRI000222	No
40	CUSTOMER INTERFACE AND ARRANGEMENTS/Network End-User sites/Lane College Info	Lane College Area - Earth	NRI000258	NRI000258	No
41	CUSTOMER INTERFACE AND ARRANGEMENTS/Network End-User sites/Lane College Info	Lane College Campus Map with Numbered Buildings	NRI000259	NRI000259	No
45	CUSTOMER INTERFACE AND ARRANGEMENTS/Solar Array Vendor Designs & Proposals	A-Series COM 4.2 frames datasheet	NRI000265	NRI000266	No
46	CUSTOMER INTERFACE AND ARRANGEMENTS/Solar Array Vendor Designs & Proposals	iSUN Solar Glare statement for planning committee	NRI000267	NRI000267	No
48	CUSTOMER INTERFACE AND ARRANGEMENTS/Solar Array Vendor Designs & Proposals	Panels laid out on Roosevelt Map	NRI000269	NRI000269	No
57	CUSTOMER INTERFACE AND ARRANGEMENTS/Solar Array Vendor Designs & Proposals/iSUN Proposals	sp_X21_470COM_460COM_ds_en_ltr_MC4Comp_527837	NRI000284	NRI000285	No
60	CUSTOMER INTERFACE AND ARRANGEMENTS/TVA & JEA	JEA Lines on Site SKM_C454e20061111080	NRI000289	NRI000289	No
61	CUSTOMER INTERFACE AND ARRANGEMENTS/TVA & JEA	JEA Requirements Discussion	NRI000290	NRI000298	No
62	CUSTOMER INTERFACE AND ARRANGEMENTS/TVA & JEA	SKM_C454e20061111080	NRI000299	NRI000299	No
63	CUSTOMER INTERFACE AND ARRANGEMENTS/TVA & JEA	TVA-JEA Power Contract	NRI000300	NRI000333	No
64	CALCULATIONS/U.S. Seismic Design Maps_files	staticmap	NRI000334	NRI000334	No
65	CALCULATIONS/U.S. Seismic Design Maps_files	vt	NRI000335	NRI000335	No
66	CALCULATIONS/U.S. Seismic Design Maps_files	vt_002	NRI000336	NRI000336	No
67	CALCULATIONS/U.S. Seismic Design Maps_files	vt_003	NRI000337	NIR000337	No
68	CALCULATIONS/U.S. Seismic Design Maps_files	vt_004	NRI000338	NRI000338	No
69	CALCULATIONS/U.S. Seismic Design Maps_files	vt_005	NRI000339	NRI000339	No
70	CALCULATIONS/U.S. Seismic Design Maps_files	vt_006	NRI000340	NRI000340	No
71	CALCULATIONS/U.S. Seismic Design Maps_files	vt_007	NRI000341	NRI000341	No
72	CALCULATIONS/U.S. Seismic Design Maps_files	vt_008	NRI000342	NRI000342	No
73	CALCULATIONS/U.S. Seismic Design Maps_files	vt_009	NRI000343	NRI000343	No
74	CALCULATIONS/U.S. Seismic Design Maps_files	vt_010	NRI000344	NRI000344	No
75	CALCULATIONS/U.S. Seismic Design Maps_files	vt_011	NRI000345	NRI000345	No
76	CALCULATIONS/U.S. Seismic Design Maps_files	vt_012	NRI000346	NRI000346	No

Tab	Production Folder	Production File Name	Beg Bates	End Bates	Confidentiality
77	CALCULATIONS/U.S. Seismic Design Maps_files	vt_013	NRI000347	NRI000347	No
78	CALCULATIONS/U.S. Seismic Design Maps_files	vt_014	NRI000348	NRI000348	No
79	CALCULATIONS/U.S. Seismic Design Maps_files	vt_015	NRI000349	NRI000349	No
80	CALCULATIONS/U.S. Seismic Design Maps_files	vt_016	NRI000350	NRI000350	No
85	DATA SHEETS/EPC Inverter	Customer Questionnaire - INST0720	NRI000359	NRI000362	No
86	DATA SHEETS/HVAC Preliminary Options	Bard W72AC SpecificationS3583	NRI000363	NRI000391	No
87	DATA SHEETS/HVAC Preliminary Options	Bard W72ACD 72 Dehumid Data 7960-811	NRI000392	NRI000404	No
90	SALES DOCS	INST0720 SD07 Rev x3 Order Transfer Checklist	NRI000409	NRI000410	No
91	SALES DOCS	INST0720 SD07 Rev x4 Order Transfer Checklist	NRI000411	NRI000412	No
92	SALES DOCS	Jackson Project Schedule - RevA - Conservative Estimate timeline provided to Denny	NRI000413	NRI000413	No
93	SALES DOCS	SACE Amicus Brief	NRI000414	NRI000417	No
96	SALES DOCS/CONTRACTS - Pos/ARCHIVED VERSIONS	CAB1000	NRI000464	NRI000468	No
97	SALES DOCS/CONTRACTS - Pos/ARCHIVED VERSIONS	InstantOn Tennessee 20MW-46MWh Award Letter	NRI000469	NRI000469	No
98	SALES DOCS/CONTRACTS - Pos/ARCHIVED VERSIONS	Kore Mark 1 Onesheet Rack-Rack Spec Sheet	NRI000470	NRI000471	No
114	SUPPLY MANAGEMENT/Purchase Orders	Site Modeling Invoice #26493	NRI000566	NRI000566	No
115	SUPPLY MANAGEMENT/Quotes/HVAC	Bard Air Conditioners and Heat pumps literature S3580	NRI000567	NRI000572	No
116	SUPPLY MANAGEMENT/Quotes/HVAC	Bard W60H Supplement Dehumidification 7960-828	NRI000573	NRI000585	No
117	SUPPLY MANAGEMENT/Quotes/HVAC	FW Webb Bard W60H Heat Pump Quote	NRI000586	NRI000586	No
118	SUPPLY MANAGEMENT/Quotes/HVAC	FW Webb Bard W60H Heat Pump Submittal Data	NRI000587	NRI000600	No
119	SUPPLY MANAGEMENT/Quotes/Renegade Steel Buildings	42 x 44 Building Sketch	NRI000601	NRI000601	No
120	SUPPLY MANAGEMENT/Quotes/Renegade Steel Buildings	Renegade 42 x 44 Building Drawings	NRI000602	NRI000609	No
122	SUPPLY MANAGEMENT/Quotes/Renegade Steel Buildings/Archive	Renegade 12 x 38 Building Sketch 1	NRI000611	NRI000611	No
123	SUPPLY MANAGEMENT/Quotes/Renegade Steel Buildings/Archive	Renegade 12 x 38 Preliminary Structure and Foundation Plan 1	NRI000612	NRI000619	No
126	SUPPLY MANAGEMENT/Quotes/Renegade Steel Buildings/Archive	Renegade 38 x 42 Building Sketch 1	NRI000622	NRI000622	No
127	SUPPLY MANAGEMENT/Quotes/Renegade Steel Buildings/Archive	Renegade 38 x 42 Preliminary Structure and Foundation Plan 1	NRI000623	NRI000630	No



BUILDING PLAN VIEW

REV		DATE	ENG	CHK	APR
X1	FOR REVIEW	30SEP2020	RHR		
REV	RELEASED STATE	DATE	ENG	CHK	APR

REVISIONS

Northern Reliability
81 Demeritt Place
Waterbury, VT 05676 USA
www.northernreliability.com

INTERPRET GEOMETRIC TOLERANCES PER ANSI Y14.5. UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES: ANGLES:±1/2° X=±1/16" .XX=±.02" .XXX=±.005"

MATERIAL: N/A

FINISH: N/A

INSTANT ON JACKSON, TENNESSEE
BATTERY ENERGY STORAGE PROJECT - DESIGN SKETCH
40 FT CONTAINER BUILDING
BUILDING PLAN VIEW

DRAWN BY: RHR	SIZE: 11x17	INST0720-B01-001	REV. X1
SCALE: NTS	CAGE CODE: 6QN29	INST0720	SHEET 1 OF 2

NRI000016

473 ft

460 ft

West Tennessee

103

5.2 ACc

SINGLE FAMILY RESIDENTIAL

SINGLE FAMILY RESIDENTIAL

SINGLE FAMILY RESIDENTIAL

SINGLE FAMILY RESIDENTIAL

Carver Av

Carver Cv

Bronzewood Cv

SEE 1"=100'

MAP 65N

SEE 1"=400'

SEE 1"=1

MAP 65

F E WRIGHT INDUSTRIL PARK

SECTION 1

P.B.3-PG.47

104

29 ACc

460 ft

460 ft

460 ft

FORESTHILLS SUBDIVISION

SECTION 5

P.B.3-PG.54

FORESTHILLS SUBDIVISION

SECTION 5

P.B.3-PG.

Stone Ridge Dr

103.03

1.3 ACc

CHURCH

PILGRIM REST BAPTIST CHURCH

2.63 ACc

198

180

132

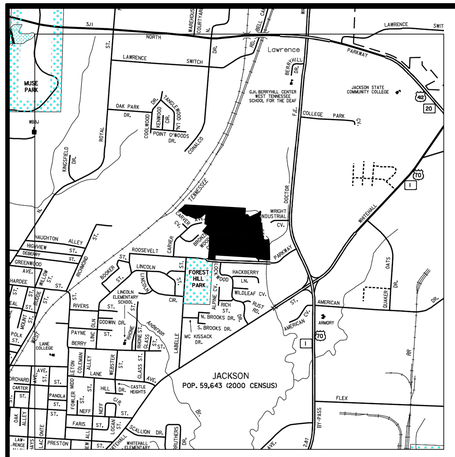
132

1.01

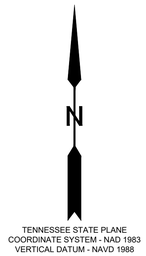
1.02

115

NRI000025



VICINITY MAP - NOT TO SCALE



TENNESSEE STATE PLANE
COORDINATE SYSTEM - NAD 1983
VERTICAL DATUM - NAVD 1988

BOUNDARY SURVEY FOR: COMMUNITY DEVELOPMENT ENTERPRISES

ROOSEVELT PARKWAY
JACKSON, TN 38301

MADISON COUNTY, TENNESSEE

TRACT 1
TAX MAP 065 PARCEL 104.00
REFERENCE: BOOK 733, PAGE 731

TRACT 2
TAX MAP 065 PARCEL 103.00
REFERENCE: BOOK 257 PAGE 455

TOTAL AREA = +/- 34.27 ACRES
TRACT 1 AREA = +/- 28.50 ACRES
TRACT 2 AREA = +/- 5.77 ACRES

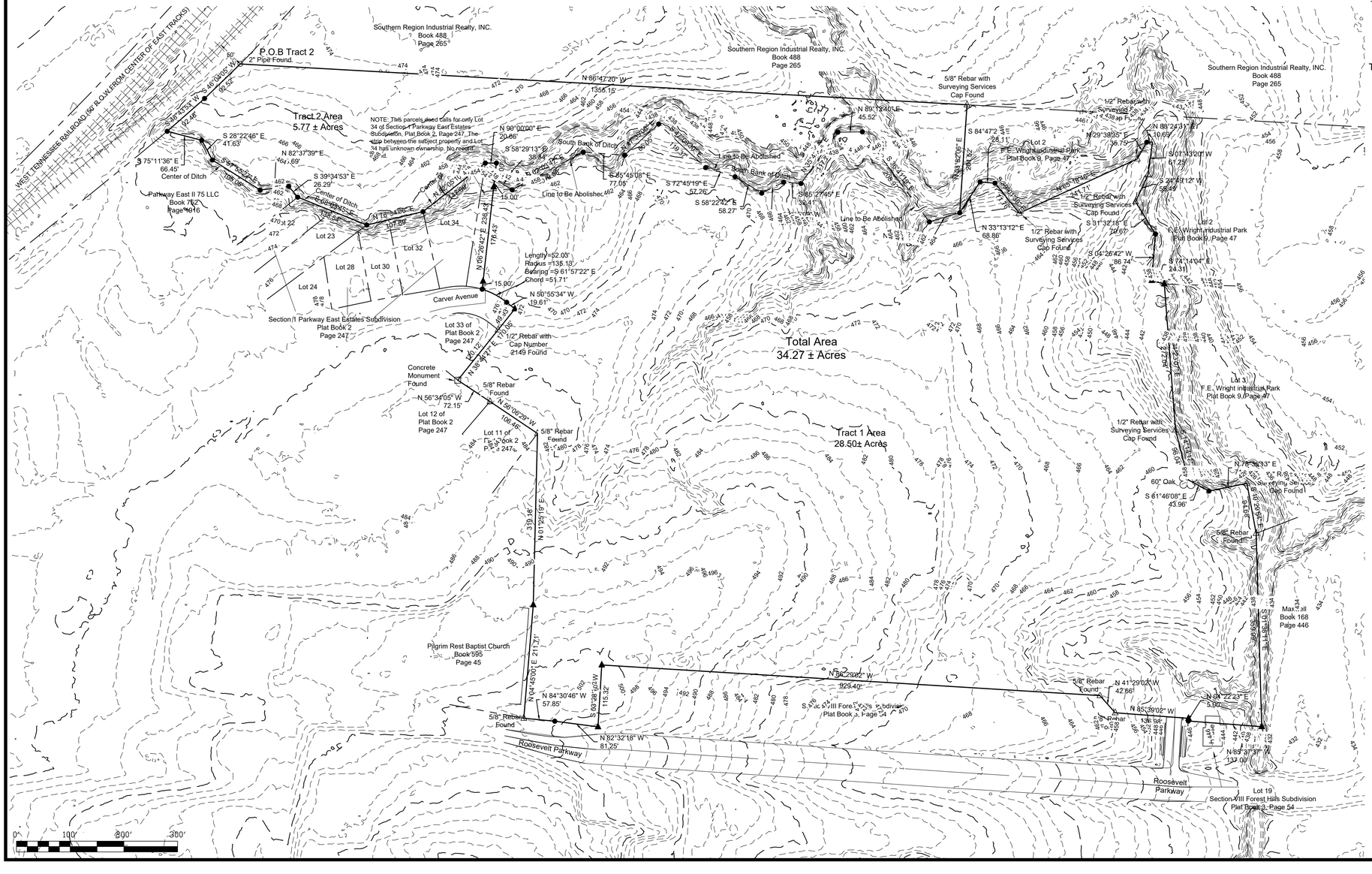
NOTE: THIS PROPERTY IS SUBJECT TO ANY AND ALL EASEMENTS, COVENANTS, OR RESTRICTIONS, EITHER WRITTEN OR UNWRITTEN. THIS SURVEY WAS COMPLETED WITHOUT THE BENEFIT OF A TITLE REPORT.

THIS SITE LIES WITHIN ZONE X, AREAS OUTSIDE OF 1% ANNUAL CHANCE V (100-YR STORM) FLOODPLAIN, AS INDICATED ON FEMA NFIP FIRM MAP NUMBER 47113CO168E, EFFECTIVE DATE OF AUGUST 3, 2009.

ENCROACHMENT NOTE:
THE HOUSE ON LOT 19 APPEARS TO ENCROACH ONTO THE PROPERTY NEAR THE SOUTH EAST CORNER OF THE SUBJECT PROPERTY.

NOTE:
TRACT 2 HAS NO APPARENT LEGAL ACCESS

SURVEY FIELD WORK WAS COMPLETED ON 12/11/2020



REVISIONS

NO.	DESCRIPTION	DATE

THIS DRAWING SHALL BE CONSIDERED PRELIMINARY IN NATURE AND, IN NO WAY, FINAL OR COMPLETE, UNLESS THE SEAL OF THE ENGINEER OR SURVEYOR OF RECORD IS AFFIXED HERETO.

WILLIAM PHILLIP SMITH
REGISTERED LAND SURVEYOR
2602
TENNESSEE

SHEET: BOUNDARY SURVEY
NUMBER: 1 of 1

L.I. Smith and Associates, Inc.
LAND DEVELOPMENT | INFRASTRUCTURE DESIGN
SURVEYING SERVICES
302 North Caldwell Street, Paris, TN 38242 | 731-644-1014 | www.lismith.com
475 Metroplex Drive, Suite 212 Nashville, TN 37211 | 615-256-0260

DRAWN BY: AJM | CHECKED BY: WPS | SCALE: 1" = 100'
PROJECT # MADISON-65-104/201044 | DATE: 01/15/2021

COMMUNITY DEV. ENT. SOLAR MICROGRID

ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TN

NRI000026

SITE DEVELOPER:

COMMUNITY DEVELOPMENT ENTERPRISES
1104 WHITEHALL STREET
JACKSON, TN 38301
PHONE: 731-240-5001
CONTACT: DENNIS EMBERLING

BUILDING & CODES:

CITY OF JACKSON
BUILDING & CODES DEPARTMENT
119 EAST MAIN STREET, SUITE 208
JACKSON, TN 38301
PHONE: 731-425-8255
CONTACT: GREG ROWLAND

CIVIL ENGINEER:

L.I. SMITH AND ASSOCIATES
302 N. CALDWELL STREET
PARIS, TN 38242
PHONE: 731-644-1014
CONTACT: PATRICK SMITH

FIRE DEPARTMENT:

CITY OF JACKSON FIRE DEPARTMENT
720 SOUTH HIGHLAND AVENUE
JACKSON, TN 38301
PHONE: 731-425-8350
CONTACT: CHIEF DARRYL SAMUELS

LAND SURVEYOR:

L.I. SMITH AND ASSOCIATES
302 N. CALDWELL STREET
PARIS, TN 38242
PHONE: 731-644-1014
CONTACT: PATRICK SMITH

SANITARY SEWER DEPT.

JACKSON ENERGY AUTHORITY
351 MARTIN LUTHER KING JR. DRIVE
JACKSON, TN 38301
PHONE: 731-422-7371

TELEPHONE:

AT&T
208 SOUTH AKARD STREET
DALLAS, TX 75202
PHONE: 800-288-2020

WATER DEPT.

JACKSON ENERGY AUTHORITY
351 MARTIN LUTHER KING JR. DRIVE
JACKSON, TN 38301
PHONE: 731-422-7371

ELECTRIC:

JACKSON ENERGY AUTHORITY
351 MARTIN LUTHER KING JR. DRIVE
JACKSON, TN 38301
PHONE: 731-422-7371

NATURAL GAS:

JACKSON ENERGY AUTHORITY
351 MARTIN LUTHER KING JR. DRIVE
JACKSON, TN 38301
PHONE: 731-422-7371

TENNESSEE ONE CALL SYSTEM, INC. 1-800-351-1111 STOP-CALL BEFORE YOU DIG!

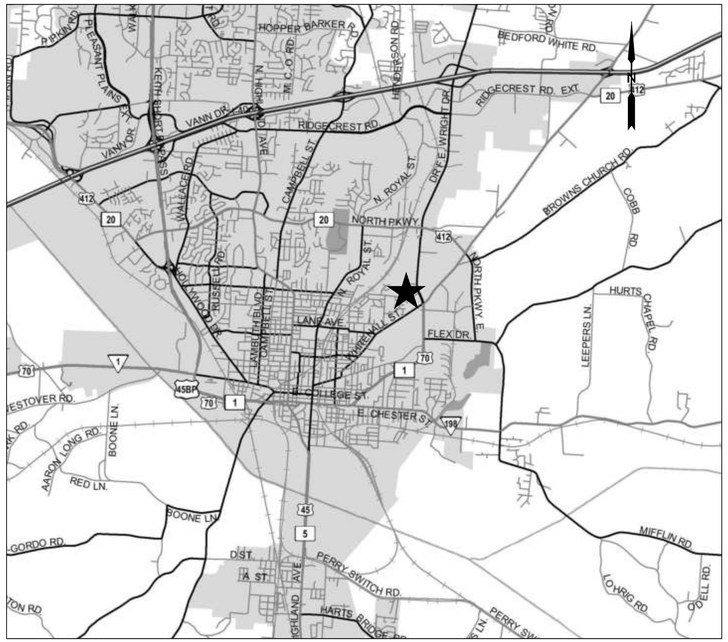
PUBLIC WORKS NOTE:
ALL WORK IN THE PUBLIC RIGHT-OF-WAY REQUIRES A PERMIT FROM THE DEPARTMENT OF PUBLIC WORKS.

COMMUNITY DEVELOPMENT ENTERPRISES

SITE PLAN

ROOSEVELT PARKWAY

JACKSON, MADISON COUNTY, TENNESSEE



VICINITY MAP - NOT TO SCALE

SITE DATA

A. OWNERS OF RECORD: HUNT PROPERTIES, 1031 GREYSTONE SQUARE, JACKSON, TN 38305; MORRIS CROCKER, 15 SUTTON PLACE, JACKSON, TN 38305

DEVELOPER: COMMUNITY DEVELOPMENT ENTERPRISES, 1104 WHITEHALL STREET, JACKSON, TN 38301

B. SOURCE OF TITLE: BOOK 733, PAGE 731 AND BOOK 257, PAGE 455
TAX MAP 65, PARCEL 103.00 AND 104.00

CITY OF JACKSON, MADISON COUNTY, TENNESSEE

SITE AREA = +/- 32 ACRES
TOTAL AREA = +/- 34.27 ACRES

C. THE SITE IS LOCATED IN UNSHADED FLOOD ZONE "X", AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS DETERMINED BY THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP NO. 471130168E, DATED AUGUST 03, 2009.

PLANNING INFORMATION

A. ZONING DESIGNATION: GENERAL RESIDENTIAL DISTRICT
FRONT SETBACK: 25 FEET
SIDE SETBACK: 8 FEET
REAR SETBACK: 10 FEET

B. INTENDEND USE: SOLAR MICROGRID

C. PARKING: NONE REQUIRED FOR INTENDED USE
REQUIRED 0 SPACES
PROPOSED 0 SPACES

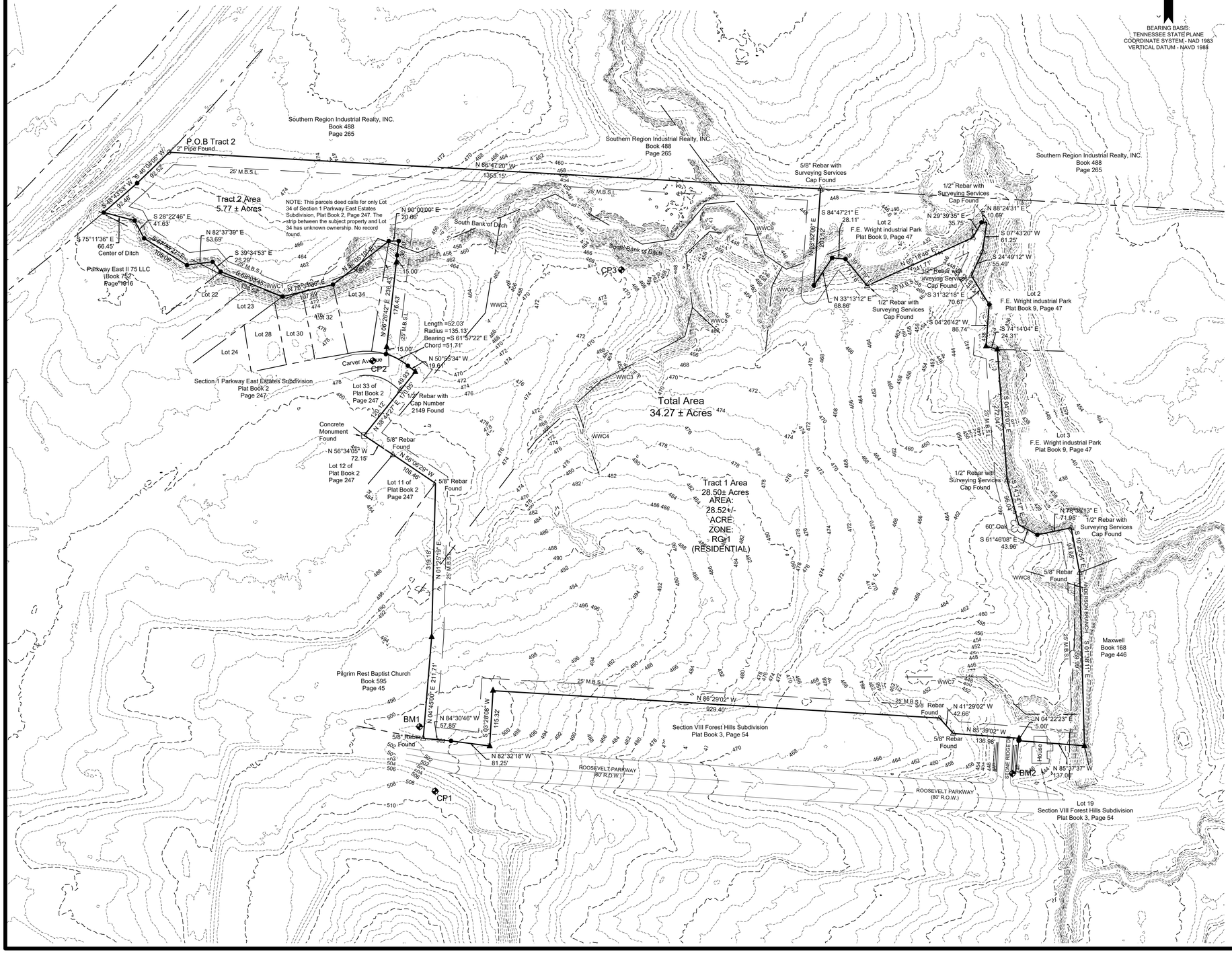
SHEET NO.	SHEET NAME	SCALE
C-000	COVER SHEET	
C-100	EXISTING	1"=100'
C-101	VEGATATIVE IMPACT EVAL.	1"=100'
C-200	LAYOUT	1"=100'
C-300	GRADING	1"=100'
C-400	E.P.S.C. PHASE 1	1"=100'
C-401	E.P.S.C. PHASE 2	1"=100'
C-402	E.P.S.C. PHASE 3	1"=100'
C-403	E.P.S.C. PHASE 4	1"=100'
C-900	DETAILS	
C-901	DETAILS	
C-902	DETAILS	
C-903	DETAILS	
C-904	DETAILS	

L.I. Smith and Associates, Inc.
LAND DEVELOPMENT | INFRASTRUCTURE DESIGN
SURVEYING SERVICES
302 North Caldwell Street, Paris, TN 38242 ı 731-644-1014 ı www.lismith.com
475 Metroplex Drive, Suite 212 Nashville, TN 37211 ı 615-256-0290

SHEET: COVER
NUMBER: C-000

REVISIONS

NRI000027



LEGEND

PROPERTY LINE	GUY WIRE
PROPERTY ADJOINER LINE	LIGHT POLE
EASEMENT LINE (ESMT)	POWER POLE
CENTERLINE OF ROAD	ELECTRICTRANSFORMER
WATER LINE	WATER METER
GAS LINE	WATER VALVE
OVERHEAD UTILITY LINE	NATURAL GAS METER
SEWER LINE	NATURAL GAS VALVE
STORM DRAIN LINE	STORM MANHOLE
OVERHEAD COMS LINE	CATCH BASIN
FLOW LINE	CLEANOUT
DRAIN AREA LINE	SIGN
REBAR FOUND	TELEPHONE PEDESTAL
5/8" REBAR WITH L.I. SMITH CAP SET	FIRE HYDRANT
UNMARKED POINT	SEWER MANHOLE
BENCHMARK	DECIDUOUS TREE
CONCRETE SURFACE	EVERGREEN TREE
ASPHALT SURFACE	

SITE DATA

A. OWNERS OF RECORD: HUNT PROPERTIES, 1031 GREYSTONE SQUARE, JACKSON, TN 38305; MORRIS CROCKER, 15 SUTTON PLACE, JACKSON, TN 38305

DEVELOPER: COMMUNITY DEVELOPMENT ENTERPRISES, 1104 WHITEHALL STREET, JACKSON, TN 38301

B. SOURCE OF TITLE: BOOK 733, PAGE 731 AND BOOK 257, PAGE 455
TAX MAP 65, PARCEL 103.00 AND 104.00

CITY OF JACKSON, MADISON COUNTY, TENNESSEE

SITE AREA = +/- 32 ACRES
TOTAL AREA = +/- 34.27 ACRES

C. THE SITE IS LOCATED IN UNSHADED FLOOD ZONE "X", AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS DETERMINED BY THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP NO. 4711301068E, DATED AUGUST 03, 2009.

SURVEYOR NOTES:

INFORMATION REGARDING THE PRESENCE, SIZE AND LOCATION OF UNDERGROUND UTILITIES IS SHOWN HEREON. THIS INFORMATION HAS BEEN SHOWN BASED ON THE LOCATION OF ABOVE GROUND APPURTENANCES, AVAILABLE DESIGN PLANS, AND FLAGS AND PAINT PLACED BY THE UNDERGROUND PROTECTION SERVICE. NO CERTIFICATION IS MADE AS TO THE ACCURACY OF THOROUGHNESS OF THE INFORMATION CONCERNING UNDERGROUND UTILITIES AND STRUCTURES SHOWN HEREON. (TENNESSEE ONE CALL SYSTEM, INC. 1-800-351-1111).

CONTACT PROPER AUTHORITIES BEFORE BUILDING NEAR UTILITY LINES, FOR EASEMENT WIDTH AND RESTRICTIONS. UTILITIES ARE APPROXIMATE AND SHOULD BE VERIFIED PRIOR TO ANY CONSTRUCTION.

THIS SURVEY HAS BEEN PREPARED FOR THE EXCLUSIVE USE OF THE PERSON ENTITIES NAMED HERON. NO EXPRESS OR IMPLIED WARRANTIES WITH RESPECT TO THE INFORMATION SHOWN HEREON IS TO BE EXTENDED TO ANY PERSONS OR ENTITIES OTHER THAN THOSE SHOWN HEREON.

THIS PROPERTY IS SUBJECT TO ALL EASEMENTS, RIGHTS OF WAY, RESTRICTIONS AND CONVEYANCES OF RECORD OR IN EXISTENCE. A TITLE COMMITMENT WAS NOT PROVIDED TO THE SURVEYOR.

THE SURVEY SHOWN HEREON WAS MADE IN ACCORDANCE WITH CHAPTER 0820-3, STANDARDS OF PRACTICE AS ADOPTED BY THE TENNESSEE STATE BOARD OF EXAMINERS FOR LAND SURVEYORS.

EXISTING CONDITIONS NOTES:

1. EXISTING SITE IS MOSTLY WOODED AND SLOPES FROM THE SOUTHWEST TO THE NORTHEAST AT A 5-8% SLOPE.
2. (9) EXISTING WET WEATHER CONVEYANCES (WWC) HAVE BEEN IDENTIFIED BY A HYDROLOGIC DETERMINATION PERFORMED BY CHRIS GROW OF GROW ENVIRONMENTAL DATED JANUARY 05, 2021.
3. AN EXISTING STREAM, ANDERSON BRANCH, RUNS ALONG THE PROPERTY LINE AT THE SOUTHEAST CORNER OF THE SITE.
4. AN EXISTING ADJOINER HOUSE, LOT 19 FOREST HILLS SUBDIVISION, APPEARS TO ENCROACH ONTO THE SITE.
5. EXCESS TOPSOIL AND TREE STUMPS WILL BE REMOVED OFFSITE.

CONTROL				
ID	NORTHING	EASTING	ELEVATION	DESCRIPTION
CP1	485434.437	1138186.576	507.00	NAIL SET
CP2	486328.707	1138057.117	477.46	NAIL SET
CP3	486517.922	1138573.650	468.05	NAIL SET
BM1	485568.348	1138154.225	502.26	REBAR SET
BM2	485474.214	1139385.985	445.28	REBAR SET
COORDINATE SYSTEM - NAD 1983				
VERTICAL DATUM - NAVD 1988				

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

COMMUNITY DEVELOPMENT ENTERPRISES
SITE PLAN
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

REVISIONS

THIS DRAWING SHALL BE CONSIDERED PRELIMINARY IN NATURE AND, IN NO WAY, FINAL OR COMPLETE, UNLESS THE SEAL OF THE ENGINEER OR SURVEYOR OF RECORD IS AFFIXED HEREIN.

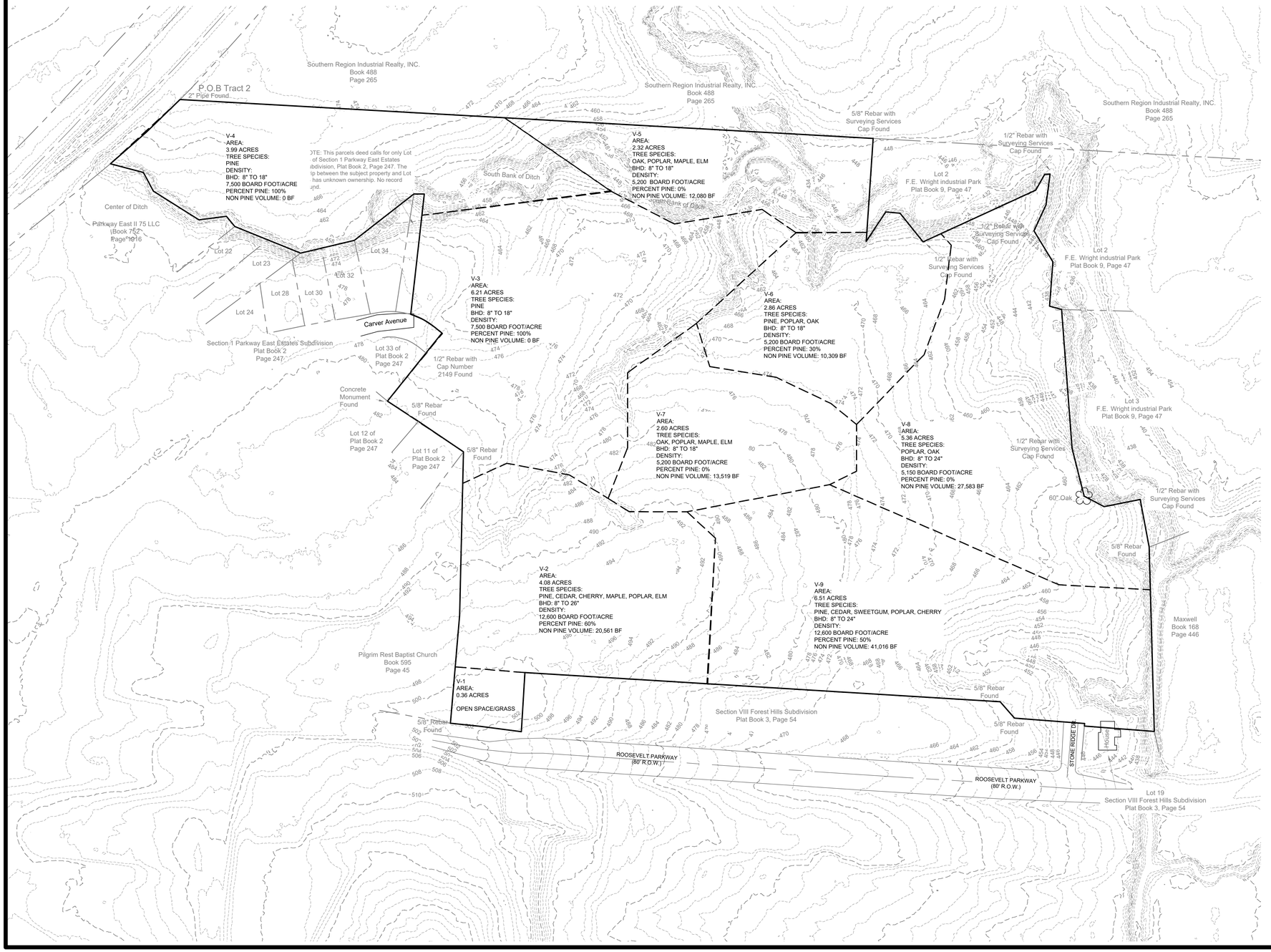
L.I. Smith and Associates, Inc.
LAND DEVELOPMENT | INFRASTRUCTURE DESIGN
SURVEYING SERVICES
302 North Caldwell Street, Paris, TN 38242 / 731-644-1014 \ www.lismith.com
475 Metroplex Drive, Suite 212 Nashville, TN 37211 \ 615-256-0290

DRAWN BY: NTG | CHECKED BY: WPS | SCALE: 1"=100' | DATE: 01/15/2021

PROJECT # 201044

SHEET: EXISTING | NUMBER: C-100

NRI000028



N

BEARING BASIS:
TENNESSEE STATE PLANE
COORDINATE SYSTEM - NAD 1983
VERTICAL DATUM - NAVD 1988

LEGEND

PROPERTY LINE	GUY WIRE
PROPERTY ADJOINER LINE	LIGHT POLE
EASEMENT LINE (ESMT)	POWER POLE
CENTERLINE OF ROAD	ELECTRICTRANSFORMER
WATER LINE	WATER METER
GAS LINE	WATER VALVE
OVERHEAD UTILITY LINE	NATURAL GAS METER
SEWER LINE	NATURAL GAS VALVE
STORM DRAIN LINE	STORM MANHOLE
OVERHEAD COMS LINE	CATCH BASIN
FLOW LINE	CLEANOUT
DRAIN AREA LINE	SIGN
REBAR FOUND	TELEPHONE PEDESTAL
5/8" REBAR WITH L.I. SMITH CAP SET	FIRE HYDRANT
UNMARKED POINT	SEWER MANHOLE
BENCHMARK	DECIDUOUS TREE
CONCRETE SURFACE	EVERGREEN TREE
ASPHALT SURFACE	

SITE DATA

A. OWNERS OF RECORD: HUNT PROPERTIES, 1031 GREYSTONE SQUARE, JACKSON, TN 38305; MORRIS CROCKER, 15 SUTTON PLACE, JACKSON, TN 38305

DEVELOPER: COMMUNITY DEVELOPMENT ENTERPRISES, 1104 WHITEHALL STREET, JACKSON, TN 38301

B. SOURCE OF TITLE: BOOK 733, PAGE 731 AND BOOK 257, PAGE 455
TAX MAP 65, PARCEL 103.00 AND 104.00

CITY OF JACKSON, MADISON COUNTY, TENNESSEE

SITE AREA = +/- 34.27 ACRES
TOTAL AREA = +/- 34.27 ACRES

C. THE PROPERTY DESCRIBED HEREON IS LOCATED IN UNSHADED FLOOD ZONE "X", AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS DETERMINED BY THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP NO. 47113O168E, DATED AUGUST 03, 2009.

AREA ID	AREA (AC)	DENSITY (BF/AC)	VOLUME (BF)	% Pine	non-pine VOLUME (BF)
V-1	0.36				
V-2	4.08	12600	51,402.56	60%	20,561
V-3	6.21	7500	46,572.31	100%	0
V-4	3.99	7500	29,961.60	100%	0
V-5	2.32	5200	12,080.81	0%	12,081
V-6	2.86	5150	14,726.68	30%	10,309
V-7	2.60	5200	13,519.16	0%	13,519
V-8	5.36	5150	27,583.48	0%	27,583
V-9	6.51	12600	82,031.90	50%	41,016
			TOTAL		125,069

Hunt-Jackson Site

Existing Conditions of the 34-acre site:

1. Existing soils - This site had three major soils types, Collins silt, Feliciana silt, and Lexington silt loam.

a. Collins silt series consists of very deep, moderately well drained, moderately permeable soils. They formed in silty alluvium on flood plains of streams in the Southern Mississippi Valley Silty Uplands Major Land Resources Area. Slopes range from 0 - 2 percent.

b. Feliciana silt loam consists of very deep, well drained, moderately permeable soil in the Southern Mississippi Valley Loess Major Land Resources Area (MLRA 134). They formed in Peoria loess deposits more than 48 inches in thickness that overly terraces and uplands of the Southern Coastal Plain. Slopes range from 0 to 40 percent.

c. Lexington silt loam consists of very deep, well drained soils on level to moderately steep uplands. The soil formed in a mantle of loess about 2 to 3 feet thick and in the underlying loamy and sandy marine sediments. Slopes ranges from 0 to 30 percent.

2. Existing vegetation:

a. Existing trees are not ancient in nature. Most of the tract of land has been farming and the whole tract has been timbered in the last 50 years. A very few trees with canopy still exist on this tract of land. The existing vegetation is recent growth since the land has been cleared and farmed. A 1940s aerial photo shows the majority of the tract in cultivation.

b. Ground cover that has taken over in the open area recently is the invasive weed, kudzu. The rest of the area is native ground cover of briars, ivy and other natural to the area.

3. Type and board feet of Trees:

a. The accompanying map shows an estimate of board feet of timber for different areas of the site. It also shows the different common species that are the most prevalent in each area.

b. This Site does not show any evidence of past logging. New growth has been established through natural reseeding.

A. Site Utilization:

1. This Site is considered to be a full use industrial site. The intended use for this site is to be full utilization of the entire property. The site will be graded to a gentle rolling grade with slopes that do not entice erosion.

2. The project Site will be covered with stone or rock over a membrane to allow for infiltration. No vegetative or tree planting will be undertaken on the site to establish new growth.

B. Vegetative Impact:

1. Due to the use and the fixtures on the site, vegetation and weedy plants would be a hindrance to the utilization.

a. All existing vegetation and tree will be removed from this site.

b. The estimated amount of harvestable timber is 1607 trees. It appears to be simple to determine an impact by the number of trees, rather than the BF of marketable lumber.

c. Since the track has no room for planting replacement trees, other conservation area needs to be secured in the Jackson City Area.

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

COMMUNITY DEVELOPMENT ENTERPRISES
SITE PLAN
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

REVISIONS

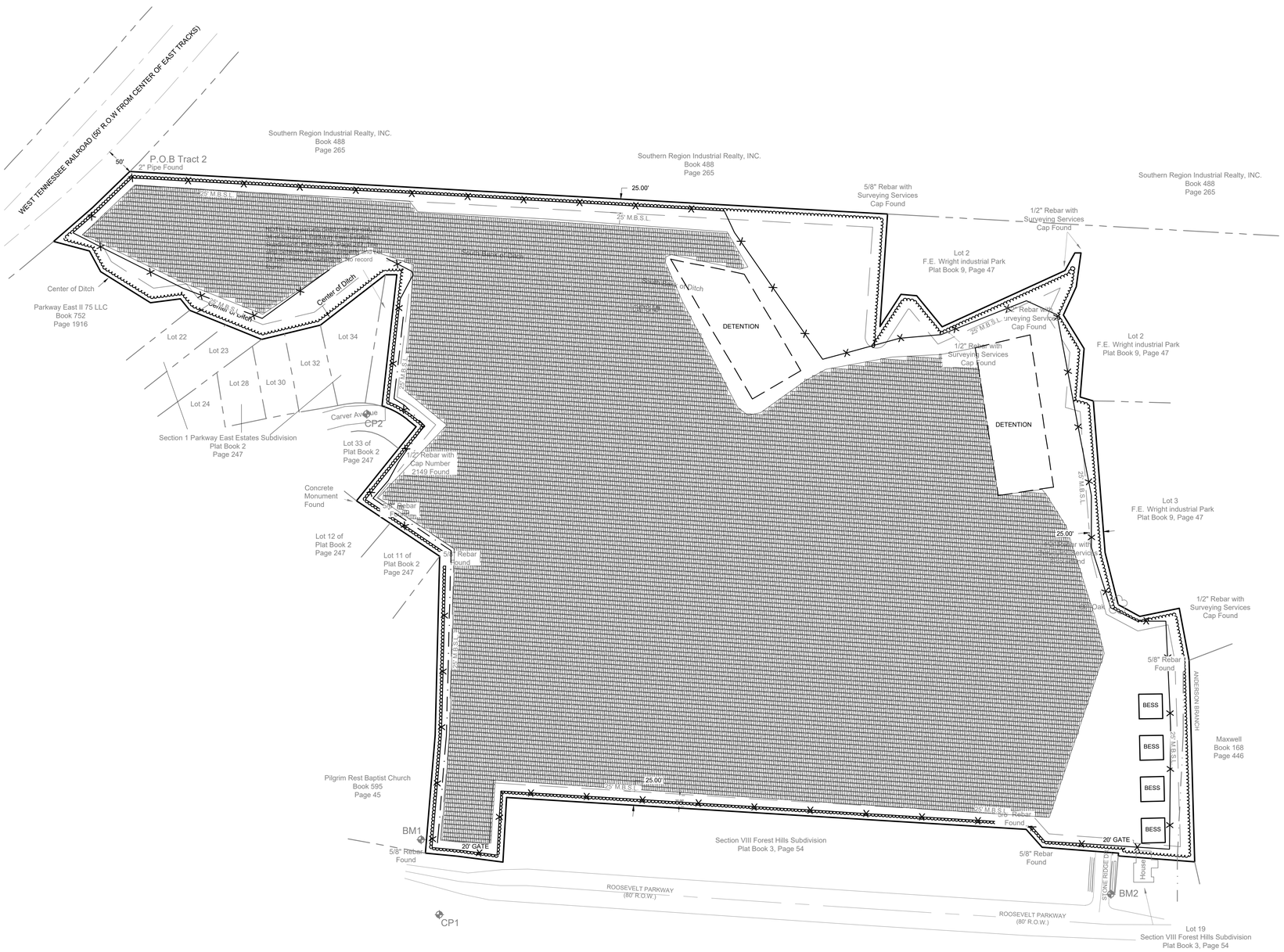
THIS DRAWING SHALL BE CONSIDERED PRELIMINARY IN NATURE AND, IN NO WAY, FINAL OR COMPLETE, UNLESS THE SEAL OF THE ENGINEER OR SURVEYOR OF RECORD IS AFFIXED HEREON.

SHEET: EXISTING TREE COVER | NUMBER: C-101

L.I. Smith and Associates, Inc.
LAND DEVELOPMENT | INFRASTRUCTURE DESIGN
SURVEYING SERVICES
302 North Caldwell Street, Paris, TN 38242 | 731-644-1014 | www.lismith.com
475 Metroplex Drive, Suite 212 Nashville, TN 37211 | 615-256-0290

DRAWN BY: NTG | CHECKED BY: WPS | SCALE: 1"=100'
PROJECT # 201044 | DATE: 01/15/2021

COMMUNITY DEVELOPMENT ENTERPRISES
SITE PLAN
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE



LEGEND

N

BEARING BASIS:
TENNESSEE STATE PLANE
COORDINATE SYSTEM - NAD 1983
VERTICAL DATUM - NAVD 1988

PROPERTY LINE	GUY WIRE
PROPERTY ADJOINER LINE	LIGHT POLE
EASEMENT LINE (ESMT)	POWER POLE
CENTERLINE OF ROAD	ELECTRICTRANSFORMER
WATER LINE	WATER METER
GAS LINE	WATER VALVE
OVERHEAD UTILITY LINE	NATURAL GAS METER
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REBAR FOUND	TELEPHONE PEDESTAL
5/8" REBAR WITH L.I. SMITH CAP SET	FIRE HYDRANT
UNMARKED POINT	SEWER MANHOLE
BENCHMARK	DECIDUOUS TREE
CONCRETE SURFACE	EVERGREEN TREE
ASPHALT SURFACE	

SITE SPECIFIC LAYOUT NOTES:

1. A 10' WIDE LANDSCAPING BUFFER WILL BE MAINTAINED AROUND THE PERIMETER OF THE SITE.
2. 6,300 LINEAR FEET OF PERIMETER FENCING WILL BE INSTALLED. (2) 20' GATES WILL BE INSTALLED FOR ACCESS.
3. APPROXIMATELY 43,900 SOLAR PANELS (40" x 78.7") WILL BE INSTALLED.
4. (4) 44'x42' BATTERY ENERGY STORAGE COMPOUNDS (BESS) WILL BE CONSTRUCTED AT THE SOUTHEAST CORNER OF THE SITE TO BE ACCESSED BY STONE RIDGE DRIVE.
5. A DIVERSION CHANNEL WILL BE INSTALLED ALONG THE WESTERN PROPERTY LINE TO DIVERT OFFSITE WATER AROUND T THE SITE.
6. (2) DETENTION PONDS WILL BE CONSTRUCTED AT THE REAR OF THE SITE.

FLOODPLAIN NOTE:

THE SITE IS LOCATED IN UNSHADED FLOOD ZONE "X", AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS DETERMINED BY THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP NO. 471130168E, DATED AUGUST 03, 2009.

CONTROL				
ID	NORTHING	EASTING	ELEVATION	DESCRIPTION
CP1	485434.437	1138186.576	507.00	NAIL SET
CP2	486328.707	1138057.117	477.46	NAIL SET
CP3	486517.922	1138573.650	468.05	NAIL SET
BM1	485568.348	1138154.225	502.26	REBAR SET
BM2	485474.214	1139385.985	445.28	REBAR SET
COORDINATE SYSTEM - NAD 1983				
VERTICAL DATUM - NAVD 1988				

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

REVISIONS

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PROJECT # 201044 | DATE: 01/15/2021

SHEET: LAYOUT NUMBER: C-200

NRI000030

PROPOSED PIPE TABLE												
FROM		TO		PIPE								
STRUCTURE	INV. ELEVATION	STRUCTURE	INV. ELEVATION	MATERIAL	DIAMETER	LENGTH	SLOPE	DRAIN AREA (AC)	FULL PIPE VELOCITY (FPS)	PIPE FLOW CAPACITY (CFS)	10 YR DESIGN FLOW (CFS)	
1	448.00	2	446.32	RCP	24"	84	2.00%	12.49	8.83	27.73	19.05	
2	435.78	3	435.00	RCP	24"	39	2.00%	12.49	8.83	27.73	19.05	
4	449.00	5	448.00	RCP	24"	50	2.00%	13.65	8.83	27.73	18.93	
5	442.58	6	442.00	RCP	24"	29	2.00%	13.65	8.83	27.73	18.93	
7	441.50	8	441.00	RCP	36"	54	0.93%	9.73	8.18	57.81	38.43	

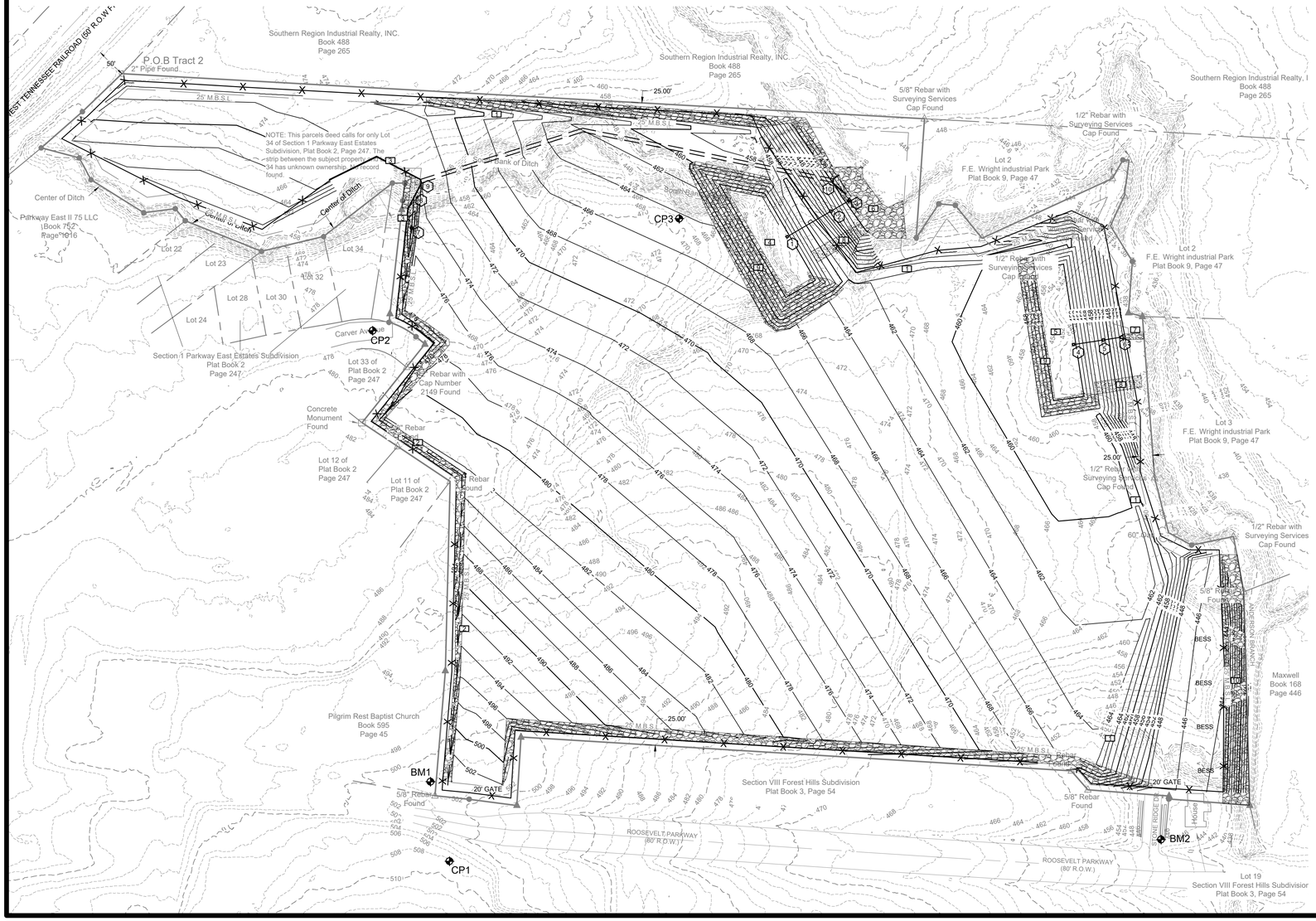
PROPOSED BOX CULVERT													
FROM		TO		SINGLE BARREL CULVERT									
STRUCTURE	INV. ELEVATION	STRUCTURE	INV. ELEVATION	SPAN HEIGHT	SPAN WIDTH	LENGTH	SLOPE	DRAIN AREA (AC)	MAX COVER (FT)	FULL PIPE VELOCITY	PIPE FLOW CAPACITY	10 YR DESIGN FLOW (CFS)	100 YR DESIGN
9	440.50	10	433.50	72"	96"	720	0.97%	84.20	25.00	13.00	520	326.31	463

PROPOSED STRUCTURE TABLE							
STRUCTURE	TYPE	RIM	INV. IN	INV. OUT	DEPTH	AREA (AC)	10YR (CFS)
1	Detention outlet	454.00	448.00	448.00	6.00	12.49	19.05
2	CB No. 42	451.00	446.32	435.78	15.22	12.49	19.05
3	Headwall	437.75		435.00	2.75	12.49	19.05
4	Detention outlet	455.00	449.00	449.00	6.00	13.65	18.93
5	CB No. 42	454.00	448.00	442.58	11.42	13.65	18.93
6	Headwall	444.75		442.00	2.75	13.65	18.93
7	CB No. 42	467.5		441.50	26.00	0.06	0.46
8	charge to WingWall			441.00		0.13	0.67
9	WING WALL 45°		440.50				
10	WING WALL 45°			433.50			

GRADING LEGEND:

1. 2' TALL CONTAINMENT BERM
2. DIVERSION CHANNEL/BERM
3. MSE RETAINING WALL
4. DETENTION POND 1
5. DETENTION POND 2
6. RIP RAP CHANNEL LINING
7. 10'x35' CLASS A-1 RIP RAP 2' MIN.
8. 20' WIDE CONCRETE SPILLWAY
9. SLOPE STABILIZATION CLASS A-1 RIP RAP 2' MIN.
10. ANDERSON BRANCH SLOPE STABILIZATION CLASS A-1 RIP RAP 2' MIN.

(X) STORMWATER STRUCTURE



BEARING BASIS:
TENNESSEE STATE PLANE
COORDINATE SYSTEM - NAD 1983
VERTICAL DATUM - NAVD 1988

LEGEND

PROPERTY LINE	GUY WIRE
PROPERTY ADJOINER LINE	LIGHT POLE
EASEMENT LINE (ESMT)	POWER POLE
CENTERLINE OF ROAD	ELECTRICTRANSFORMER
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GAS LINE	WATER VALVE
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FLOW LINE	CLEANOUT
DRAIN AREA LINE	SIGN
REBAR FOUND	TELEPHONE PEDESTAL
5/8" REBAR WITH L.I. SMITH CAP SET	FIRE HYDRANT
UNMARKED POINT	SEWER MANHOLE
BENCHMARK	DECIDUOUS TREE
CONCRETE SURFACE	EVERGREEN TREE
ASPHALT SURFACE	

SITE GRADING NOTES:

1. AN EXISTING WET WEATHER CONVEYANCE (WWC1) WILL BE REPLACED WITH 720' OF 6'x8' REINFORCED CONCRETE BOX CULVERT.
2. EXISTING WWC WILL BE FILLED IN. EXISTING CHANNEL WALLS WILL BE BENCHED BACK AT EACH 6" LIFT TO ENSURE PROPER COMPACTION AND COHESION TO EXISTING SOILS.
3. ALL FILL MATERIAL SHALL BE PLACED IN 6" LIFTS AND COMPACTED TO A 95% STANDARD PROCTOR. (ASTM D698)
4. SITE GRADES WILL SLOPE GENERALLY TOWARDS THE NORTH EAST AT 3-5% SLOPES.
5. A DIVERSION CHANNEL/BERM WILL BE CONSTRUCTED ALONG THE WEST SIDE OF THE SITE. THIS DIVERSION CHANNEL WILL DIRECT OFFSITE WATER AROUND THE SITE TO A DROP INLET THAT WILL DISCHARGE INTO THE WINGWALL OF THE NEW BOX CULVERT. DIVERSION CHANNEL WILL BE STABILIZED WITH CLASS A-1 RIP RAP AT A MIN. DEPTH OF 2 OVER GEOTEXTILE FABRIC'.
6. A 2' TALL CONTAINMENT BERM WILL BE CONSTRUCTED ALONG THE LOWER END OF THE SITE. CONTAINMENT BERM WILL DIVERT STORMWATER RUNOFF FROM THE SITE INTO ONE OF TWO DETENTION PONDS.
7. FILL SLOPES ALONG THE NORTH PROPERTY LINE WILL BE STABILIZED WITH CLASS A-1 RIP RAP AT A MIN DEPTH OF 2' OVER GEOTEXTILE FABRIC.
8. FORE SLOPES OF BOTH DETENTION PONDS WILL BE STABILIZED WITH CLASS A-1 RIP RAP AT A MIN DEPTH OF 2' OVER GEOTEXTILE FABRIC.
9. EXISTING CHANNEL WILL BE LINED FOR 135 BELOW THE OUTLET HEADWALL OF THE NEW BOX CULVERT WITH CLASS A-1 RIP RAP AT A MIN DEPTH OF 3' OVER GEOTEXTILE FABRIC.

POND NOTE:
CONTRACTOR TO ENSURE POST CONSTRUCTION SEDIMENT REMOVAL TO ENSURE FINAL POND ELEVATIONS ARE MAINTAINED AND FUNCTION AS INTENDED.

CONTROL				
ID	NORTHING	EASTING	ELEVATION	DESCRIPTION
CP1	485434.437	1138186.576	507.00	NAIL SET
CP2	486328.707	1138057.117	477.46	NAIL SET
CP3	486517.922	1138573.650	468.05	NAIL SET
BM1	485568.348	1138154.225	502.26	REBAR SET
BM2	485474.214	1139385.985	445.28	REBAR SET
COORDINATE SYSTEM - NAD 1983				
VERTICAL DATUM - NAVD 1988				

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

COMMUNITY DEVELOPMENT ENTERPRISES
SITE PLAN
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

REVISIONS

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PROJECT # 201044		DATE: 01/15/2021	

SHEET: GRADING NUMBER: C-300

NRI000031

COMMUNITY DEVELOPMENT ENTERPRISES
SITE PLAN
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

OUTFALL #	LATITUDE (N)	LONGITUDE (W)	APPROX. ELEV. (FEET)	PRE AREA (ACRES)	POST AREA (ACRES)	RECIEVING WATERS
OUTFALL 1	35.637373	88.796385	463	0.98	0.98	ANDERSON BRANCH
OUTFALL 2	35.637331	88.795473	461	1.14	1.14	ANDERSON BRANCH
OUTFALL 3	35.633755	88.794744	457	0.64	0.47	ANDERSON BRANCH
OUTFALL 4	35.637763	88.794225	455	0.67	0.00	ANDERSON BRANCH
OUTFALL 5	35.637675	88.792950	436	0.91	1.26	ANDERSON BRANCH
OUTFALL 6	35.637470	88.794722	445	0.40	9.34	ANDERSON BRANCH
OUTFALL 7	35.637471	88.794206	450	9.73	0.00	ANDERSON BRANCH
OUTFALL 8	35.637401	88.792955	440	10.12	12.49	ANDERSON BRANCH
OUTFALL 9	35.637285	88.792312	442	0.83	0.00	ANDERSON BRANCH
OUTFALL 10	35.636967	88.790871	442	6.07	13.65	ANDERSON BRANCH
OUTFALL 11	35.635639	88.790160	430	2.06	0.43	ANDERSON BRANCH
OUTFALL 12	35.634869	88.790127	427	7.13	2.89	ANDERSON BRANCH

EROSION CONTROL LEGEND

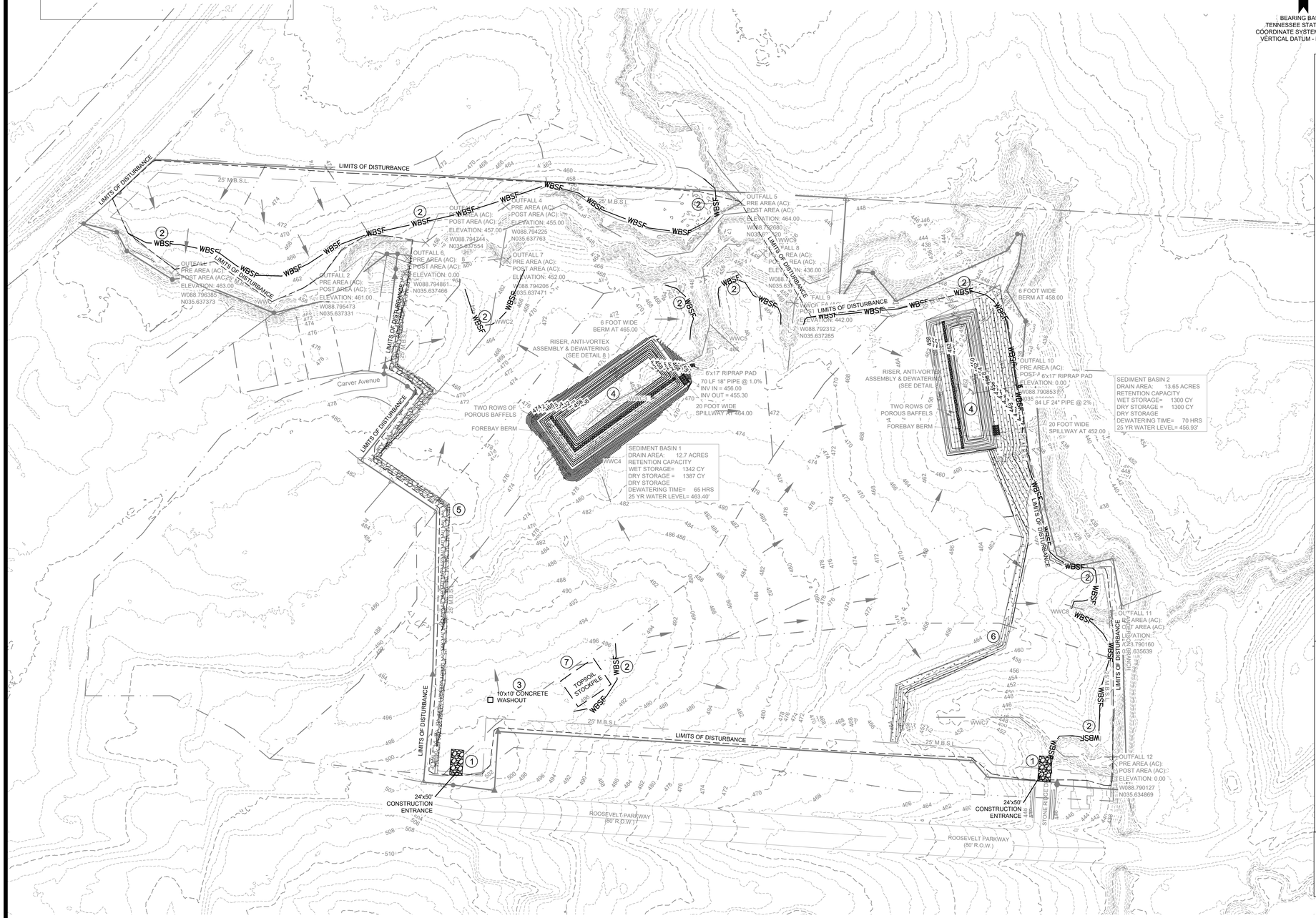
- LIMITS OF CONSTRUCTION
- WBSF — WBSF — WIRE BACKED SILT FENCE
- CHECK DAM
- INLET PROTECTION
- LANDSCAPING/SUITABLE COVER

LEGEND

- PROPERTY LINE
- PROPERTY ADJOINER LINE
- EASEMENT LINE (ESMT)
- CENTERLINE OF ROAD
- WATER LINE
- GAS LINE
- OVERHEAD UTILITY LINE
- SEWER LINE
- STORM DRAIN LINE
- OVERHEAD COMS LINE
- FLOW LINE
- DRAIN AREA LINE
- REBAR FOUND
- 5/8" REBAR WITH L.I. SMITH CAP SET
- UNMARKED POINT
- BENCHMARK
- CONCRETE SURFACE
- ASPHALT SURFACE
- GUY WIRE
- LIGHT POLE
- POWER POLE
- ELECTRICTRANSFORMER
- WATER METER
- WATER VALVE
- NATURAL GAS METER
- NATURAL GAS VALVE
- STORM MANHOLE
- CATCH BASIN
- CLEANOUT
- SIGN
- TELEPHONE PEDESTAL
- FIRE HYDRANT
- SEWER MANHOLE
- DECIDUOUS TREE
- EVERGREEN TREE

N

BEARING BASIS:
TENNESSEE STATE PLANE
COORDINATE SYSTEM - NAD 1983
VERTICAL DATUM - NAVD 1988



EROSION CONTROL NOTES:

1. NO TREES ARE TO BE REMOVED AND/OR VEGETATION DISTURBED EXCEPT AS NECESSARY FOR GRADING PURPOSES AND ONLY AS APPROVED BY OWNER'S REPRESENTATIVE AND TOWN ENGINEER.
2. TOPSOIL IS TO BE STRIPPED FROM ALL CUT AND FILL AREAS, STOCKPILED AND REDISTRIBUTED OVER GRADED AREAS TO A MINIMUM OF 6".
3. ALL GRADED AREAS, INCLUDING SLOPES, ARE TO BE STABILIZED AS SOON AS POSSIBLE AFTER GRADING IS COMPLETED, BUT NO LONGER THAN 14 DAYS LATER.
4. CONSTRUCT EROSION CONTROL AS SHOWN ON DRAWINGS PRIOR TO BEGINNING GRADING OPERATIONS.
5. ALL NEW STRUCTURES AND EXISTING STRUCTURES SHALL HAVE SEDIMENT REMOVED PRIOR TO ACCEPTANCE.
6. SILT BARRIERS SHALL BE CLEANED OF ACCUMULATED SEDIMENT WHEN APPROXIMATELY 33% FILLED WITH SUCH SEDIMENT.
7. ALL DIMENSIONS AND LOCATIONS OF TEMPORARY EROSION AND WATER POLLUTION CONTROL DEVICES SHALL BE SUBJECT TO ADJUSTMENT AS DESIGNATED BY THE OWNER'S REPRESENTATIVE AND TOWN ENGINEER.
8. WHEN THE TEMPORARY SOIL EROSION AND WATER POLLUTION DEVICES ARE NO LONGER REQUIRED FOR THE INTENDED PURPOSE IN THE OPINION OF THE OWNER'S REPRESENTATIVE AND TOWN ENGINEER, THEY SHALL BE REMOVED.
9. REPLACE SILT BARRIERS WHEN CONDITIONS WARRANT AND AS DIRECTED BY THE OWNER'S REPRESENTATIVE AND TOWN ENGINEER.
10. ALL SLOPES 3:1 OR STEEPER SHALL BE STABILIZED WITH EROSION CONTROL MATTING INSTALLED PER MANUFACTURERS' RECOMMENDATIONS, OR SOD.
11. ANY MUD/CONSTRUCTION DEBRIS THAT MAY BE TRANSPORTED TO SURROUNDING ROADS, OR OTHER SURROUNDING ROADS OR PARKING AREAS SHALL BE CLEANED UP IMMEDIATELY.
12. GENERAL CONTRACTOR SHALL KEEP GROUND DISTURBANCE TO THE MINIMUM REQUIRED TO COMPLETE THE PROJECT. ALL AREAS MUST BE TEMPORARILY OR PERMANENTLY STABILIZED IF DISTURBED AREA HAS NOT BEEN WORKED WITHIN THE PAST 14 DAYS.
13. SOD SHALL BE TURF TYPE TALL FESCUE.
14. TIME OF EXPOSURE OF UNPROTECTED SOILS SHALL BE KEPT TO A MAXIMUM PERIOD OF 7 DAYS. TEMPORARY STABILIZATION MEASURES, I.E. SEEDING & MULCHING, SHALL BE PERFORMED ON ANY UNPROTECTED AREA WHERE CONSTRUCTION OPERATIONS WILL CEASE FOR 7 OR MORE DAYS.
15. KEEP DUST WITHIN TOLERABLE LIMITS BY SPRINKLING OR OTHER ACCEPTABLE MEANS.
16. CONSTRUCTION ENTRANCE SHALL BE IN PLACE PRIOR TO ANY COMBUSTIBLES, I.E. CONSTRUCTION TRAILER, LUMBER, ETC. BEING PRESENT ON JOB SITE. IN ADDITION TO THE CONSTRUCTION ENTRANCE, AN ALL WEATHER DRIVE MUST BE IN PLACE AND ACCESSIBLE TO ALL AREAS OF THE CONSTRUCTION SITE THAT WILL CONTAIN COMBUSTIBLES THROUGHOUT ALL PHASES OF THE CONSTRUCTION PROCESS. THE ALL WEATHER DRIVE SHALL BE NO LESS THAN 20 FEET OF UNOBSTRUCTED WIDTH WITH ADEQUATE TURNING RADIUS CAPABLE OF SUPPORTING THE IMPOSED LOADS OF THE FIRE DEPARTMENT APPARATUS.
17. USE TEMPORARY VEGETATION AND/OR MULCH TO PROTECT BARE AREAS FROM EROSION DURING CONSTRUCTION.
18. NO OTHER WORK WILL BE INITIATED ON THE PROJECT UNTIL THE EROSION/SILTATION MEASURES SHOWN ON THE PLANS AND DETAILS ARE PROPERLY IN PLACE.
19. IF, AT ANY TIME DURING THE CONSTRUCTION PHASE OF THIS PROJECT, THE EROSION/SILTATION MEASURES INSTALLED FAIL TO FUNCTION PROPERLY, NEED MAINTENANCE OR REPAIR, OR NEED NEW REPLACEMENT IN ANY KIND, THE CONTRACTOR WILL EFFECT SUCH ACTIONS AS ARE NEEDED TO CORRECT THE SITUATION AT NO ADDITIONAL COST TO THE OWNER.
20. DISTURBED AREAS ARE TO BE GRADED TO DRAIN AS INDICATED ON PLAN TO SEDIMENT BARRIERS DURING AND UPON COMPLETION OF CONSTRUCTION.
21. ALL CUT/FILL AREAS TO BE LANDSCAPED OR THAT HAVE A VEGETATIVE COVER POST-CONSTRUCTION, SHALL HAVE A MINIMUM OF 6-INCH DEPTH TOPSOIL COVER. AREAS DRESSED WITH TOPSOIL SHALL BE SODDED AS SHOWN ON SHEET L1, LANDSCAPING PLAN.
22. UPON STABILIZATION OF THE PROJECT SITE WITH A GOOD (ACCEPTABLE) STAND OF GRASS AND/OR GROUND COVER, THE EROSION/SILTATION INSTALLATIONS WILL BE REMOVED AND THE AREA DISTURBED WILL BE SODDED AS OTHER NEW GRASSED AREAS OF THE PROJECT.

SITE SPECIFIC EROSION CONTROL NOTES:

1. CONTRACTOR TO INSTALL AND MAINTAIN VEHICLE TRACKING CONTROL (CONSTRUCTION ENTRANCE/EXIT) (REF C-900).
2. CONTRACTOR TO INSTALL AND MAINTAIN WIRE BACKED SILT FENCE PERIMETER (REF. C-900).
3. CONTRACTOR TO INSTALL AND MAINTAIN 10' X 10' CONCRETE WASHOUT PIT WITH DIRECTIONAL SIGNS (REF. C-900).
4. CONSTRUCT A SEDIMENT BASIN WITH ASSOCIATED RISER, DISCHARGE, FOREBAY, AND POROUS BAFFELS. (REF. C-900).
5. CONSTRUCT A DIVERSION DITCH TO ROUTE 9.33 ACRES OF OFFSITE DRAINAGE AROUND THE SITE AT OUTFALL 6 (REF. C-900) TO KEEP DRAINAGE AREA TO OUTFALL 7 UNDER 5 ACRES..
6. CONSTRUCT A DIVERSION BERM TO ROUTE 5.5 ACRES OF DRAINAGE TO SEDIMENT BASIN 2 TO KEEP THE DRAINAGE AREA TO OUTFALL 12 UNDER 5 ACRES (REF. C-900).
7. STOCKPILE TOPSOIL AT DESIGNATED AREA.

FLOODPLAIN NOTE:

THE SITE IS LOCATED IN UNSHADED FLOOD ZONE "X", AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS DETERMINED BY THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP NO. 47113G168E, DATED AUGUST 03, 2009.

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

REVISIONS

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DRAWN BY: NTG	CHECKED BY: WPS	SCALE: 1"=100'
PROJECT # 201044		DATE: 01/15/2021

SHEET: E.P.S.C PHASE 1 NUMBER: C-400

NRI000032

COMMUNITY DEVELOPMENT ENTERPRISES
SITE PLAN
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

OUTFALL #	LATITUDE (N)	LONGITUDE (W)	APPROX. ELEV. (FEET)	PRE AREA (ACRES)	POST AREA (ACRES)	RECIEVING WATERS
OUTFALL 1	35.637373	88.796385	463	0.98	0.98	ANDERSON BRANCH
OUTFALL 2	35.637331	88.795473	461	1.14	1.14	ANDERSON BRANCH
OUTFALL 3	35.633755	88.794744	457	0.64	0.47	ANDERSON BRANCH
OUTFALL 4	35.637763	88.794225	455	0.67	0.00	ANDERSON BRANCH
OUTFALL 5	35.637675	88.792950	436	0.91	1.26	ANDERSON BRANCH
OUTFALL 6	35.637470	88.794722	445	0.40	9.34	ANDERSON BRANCH
OUTFALL 7	35.637471	88.794206	450	9.73	0.00	ANDERSON BRANCH
OUTFALL 8	35.637401	88.792955	440	10.12	12.49	ANDERSON BRANCH
OUTFALL 9	35.637285	88.792312	442	0.83	0.00	ANDERSON BRANCH
OUTFALL 10	35.636967	88.790871	442	6.07	13.65	ANDERSON BRANCH
OUTFALL 11	35.635639	88.790160	430	2.06	0.43	ANDERSON BRANCH
OUTFALL 12	35.634869	88.790127	427	7.13	2.89	ANDERSON BRANCH

EROSION CONTROL LEGEND

- LIMITS OF CONSTRUCTION
- WBSF — WBSF — WIRE BACKED SILT FENCE
- CHECK DAM
- INLET PROTECTION
- LANDSCAPING/SUITABLE COVER

LEGEND

- PROPERTY LINE
- PROPERTY ADJOINER LINE
- EASEMENT LINE (ESMT)
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- WATER LINE
- GAS LINE
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- SEWER LINE
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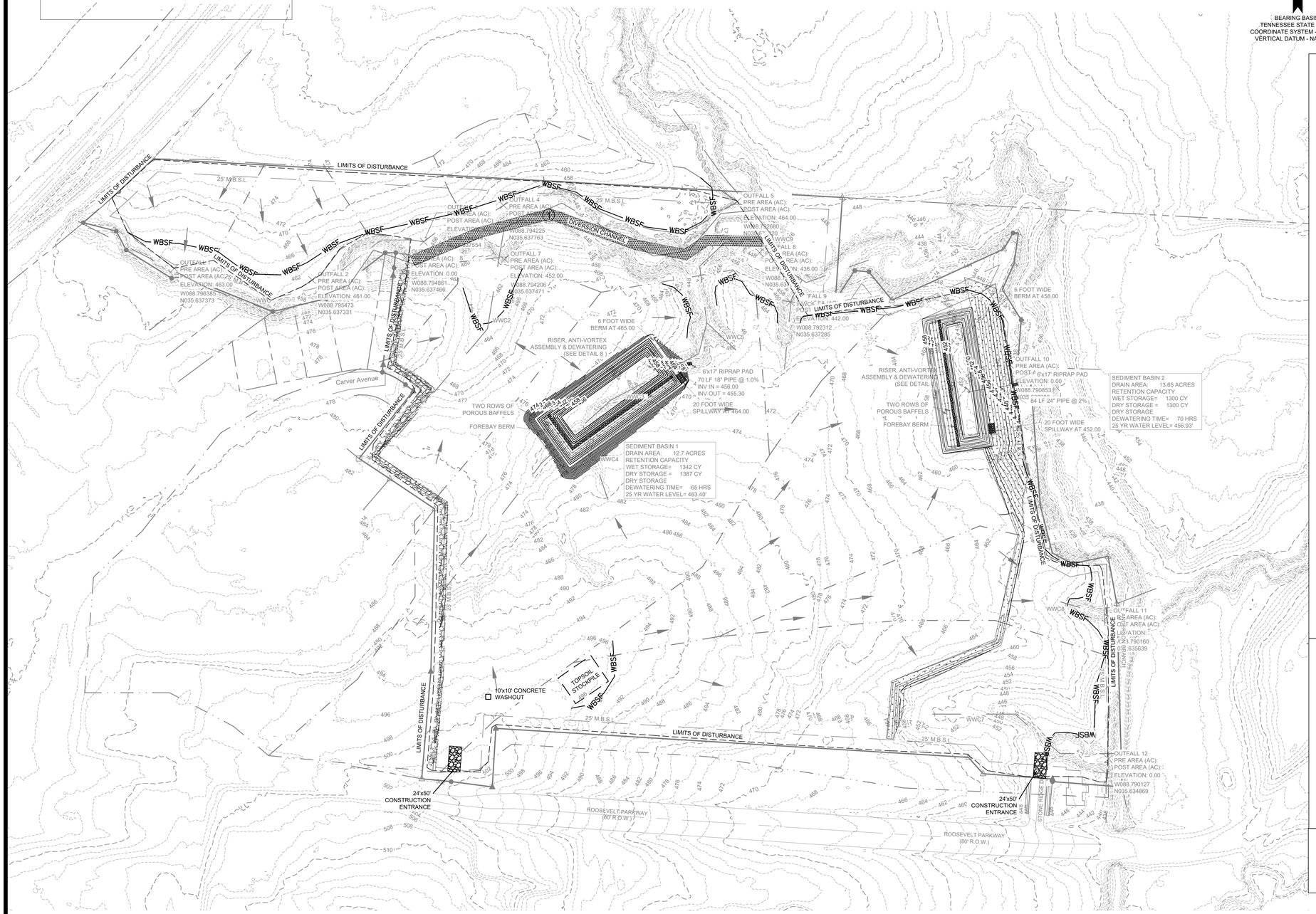
- OVERHEAD COMS LINE
- FLOW LINE
- DRAIN AREA LINE
- REBAR FOUND
- 5/8" REBAR WITH L.I. SMITH CAP SET
- UNMARKED POINT
- BENCHMARK
- CONCRETE SURFACE
- ASPHALT SURFACE
- GUY WIRE
- LIGHT POLE
- POWER POLE
- ELECTRICTRANSFORMER
- WATER METER
- WATER VALVE
- NATURAL GAS METER
- NATURAL GAS VALVE
- STORM MANHOLE
- CATCH BASIN
- CLEANOUT
- SIGN
- TELEPHONE PEDESTAL
- FIRE HYDRANT
- SEWER MANHOLE
- DECIDUOUS TREE
- EVERGREEN TREE

N

BEARING BASIS:
TENNESSEE STATE PLANE
COORDINATE SYSTEM - NAD 1983
VERTICAL DATUM - NAVD 1988



EROSION CONTROL NOTES:

1. NO TREES ARE TO BE REMOVED AND/OR VEGETATION DISTURBED EXCEPT AS NECESSARY FOR GRADING PURPOSES AND ONLY AS APPROVED BY OWNER'S REPRESENTATIVE AND TOWN ENGINEER.
2. TOPSOIL IS TO BE STRIPPED FROM ALL CUT AND FILL AREAS, STOCKPILED AND REDISTRIBUTED OVER GRADED AREAS TO A MINIMUM OF 6".
3. ALL GRADED AREAS, INCLUDING SLOPES, ARE TO BE STABILIZED AS SOON AS POSSIBLE AFTER GRADING IS COMPLETED, BUT NO LONGER THAN 14 DAYS LATER.
4. CONSTRUCT EROSION CONTROL AS SHOWN ON DRAWINGS PRIOR TO BEGINNING GRADING OPERATIONS.
5. ALL NEW STRUCTURES AND EXISTING STRUCTURES SHALL HAVE SEDIMENT REMOVED PRIOR TO ACCEPTANCE.
6. SILT BARRIERS SHALL BE CLEANED OF ACCUMULATED SEDIMENT WHEN APPROXIMATELY 33% FILLED WITH SUCH SEDIMENT.
7. ALL DIMENSIONS AND LOCATIONS OF TEMPORARY EROSION AND WATER POLLUTION CONTROL DEVICES SHALL BE SUBJECT TO ADJUSTMENT AS DESIGNATED BY THE OWNER'S REPRESENTATIVE AND TOWN ENGINEER.
8. WHEN THE TEMPORARY SOIL EROSION AND WATER POLLUTION DEVICES ARE NO LONGER REQUIRED FOR THE INTENDED PURPOSE IN THE OPINION OF THE OWNER'S REPRESENTATIVE AND TOWN ENGINEER, THEY SHALL BE REMOVED.
9. REPLACE SILT BARRIERS WHEN CONDITIONS WARRANT AND AS DIRECTED BY THE OWNER'S REPRESENTATIVE AND TOWN ENGINEER.
10. ALL SLOPES 3:1 OR STEEPER SHALL BE STABILIZED WITH EROSION CONTROL MATTING INSTALLED PER MANUFACTURERS' RECOMMENDATIONS, OR SOD.
11. ANY MUD/CONSTRUCTION DEBRIS THAT MAY BE TRANSPORTED TO SURROUNDING ROADS, OR OTHER SURROUNDING ROADS OR PARKING AREAS SHALL BE CLEANED UP IMMEDIATELY.
12. GENERAL CONTRACTOR SHALL KEEP GROUND DISTURBANCE TO THE MINIMUM REQUIRED TO COMPLETE THE PROJECT. ALL AREAS MUST BE TEMPORARILY OR PERMANENTLY STABILIZED IF DISTURBED AREA HAS NOT BEEN WORKED WITHIN THE PAST 14 DAYS.
13. SOD SHALL BE TURF TYPE TALL FESCUE.
14. TIME OF EXPOSURE OF UNPROTECTED SOILS SHALL BE KEPT TO A MAXIMUM PERIOD OF 7 DAYS. TEMPORARY STABILIZATION MEASURES, I.E. SEEDING & MULCHING, SHALL BE PERFORMED ON ANY UNPROTECTED AREA WHERE CONSTRUCTION OPERATIONS WILL CEASE FOR 7 OR MORE DAYS.
15. KEEP DUST WITHIN TOLERABLE LIMITS BY SPRINKLING OR OTHER ACCEPTABLE MEANS.
16. CONSTRUCTION ENTRANCE SHALL BE IN PLACE PRIOR TO ANY COMBUSTIBLES, I.E. CONSTRUCTION TRAILER, LUMBER, ETC. BEING PRESENT ON JOB SITE. IN ADDITION TO THE CONSTRUCTION ENTRANCE, AN ALL WEATHER DRIVE MUST BE IN PLACE AND ACCESSIBLE TO ALL AREAS OF THE CONSTRUCTION SITE THAT WILL CONTAIN COMBUSTIBLES THROUGHOUT ALL PHASES OF THE CONSTRUCTION PROCESS. THE ALL WEATHER DRIVE SHALL BE NO LESS THAN 20 FEET OF UNOBSTRUCTED WIDTH WITH ADEQUATE TURNING RADIUS CAPABLE OF SUPPORTING THE IMPOSED LOADS OF THE FIRE DEPARTMENT APPARATUS.
17. USE TEMPORARY VEGETATION AND/OR MULCH TO PROTECT BARE AREAS FROM EROSION DURING CONSTRUCTION.
18. NO OTHER WORK WILL BE INITIATED ON THE PROJECT UNTIL THE EROSION/SILTATION MEASURES SHOWN ON THE PLANS AND DETAILS ARE PROPERLY IN PLACE.
19. IF, AT ANY TIME DURING THE CONSTRUCTION PHASE OF THIS PROJECT, THE EROSION/SILTATION MEASURES INSTALLED FAIL TO FUNCTION PROPERLY, NEED MAINTENANCE OR REPAIR, OR NEED NEW REPLACEMENT IN ANY KIND, THE CONTRACTOR WILL EFFECT SUCH ACTIONS AS ARE NEEDED TO CORRECT THE SITUATION AT NO ADDITIONAL COST TO THE OWNER.
20. DISTURBED AREAS ARE TO BE GRADED TO DRAIN AS INDICATED ON PLAN TO SEDIMENT BARRIERS DURING AND UPON COMPLETION OF CONSTRUCTION.
21. ALL CUT/FILL AREAS TO BE LANDSCAPED OR THAT HAVE A VEGETATIVE COVER POST-CONSTRUCTION, SHALL HAVE A MINIMUM OF 6-INCH DEPTH TOPSOIL COVER. AREAS DRESSED WITH TOPSOIL SHALL BE SODDED AS SHOWN ON SHEET L1, LANDSCAPING PLAN.
22. UPON STABILIZATION OF THE PROJECT SITE WITH A GOOD (ACCEPTABLE) STAND OF GRASS AND/OR GROUND COVER, THE EROSION/SILTATION INSTALLATIONS WILL BE REMOVED AND THE AREA DISTURBED WILL BE SODDED AS OTHER NEW GRASSED AREAS OF THE PROJECT.

SITE SPECIFIC EROSION CONTROL NOTES:

1. CONSTRUCT DIVERSION CHANNEL IN EXISTING CHANNEL TO ROUTE WATER AROUND THE CONSTRUCTION OF THE BOX CULVERT . DIVERSION DITCH MUST HAVE A MINIMAL CROSS SECTIONAL AREA OF 32 SQUARE FEET(REF. C-903).

FLOODPLAIN NOTE:

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GRAPHIC SCALE

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REVISIONS

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SHEET: E.P.S.C PHASE 2 | NUMBER: C-401

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DRAWN BY: NTG | CHECKED BY: WPS | SCALE: 1"=100' | DATE: 01/15/2021 | PROJECT # 201044

NRI000033

COMMUNITY DEVELOPMENT ENTERPRISES
SITE PLAN
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

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BEARING BASIS:
TENNESSEE STATE PLANE
COORDINATE SYSTEM - NAD 1983
VERTICAL DATUM - NAVD 1988

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21. UPON STABILIZATION OF THE PROJECT SITE WITH A GOOD (ACCEPTABLE) STAND OF GRASS AND/OR GROUND COVER, THE EROSION/SILTATION INSTALLATIONS WILL BE REMOVED AND THE AREA DISTURBED WILL BE SODDED AS OTHER NEW GRASSED AREAS OF THE PROJECT.

SITE SPECIFIC EROSION CONTROL NOTES:

1. CONSTRUCT DETENTION POND AND STABILIZE WITH SOD (REF. C-901).
2. CONSTRUCT PERMANENT DIVERSION BERM TO DIRECT FLOW OF STORMWATER TO DETENTION POND 2 (REF. C-901).

FLOODPLAIN NOTE:

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GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

REVISIONS

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SHEET: E.P.S.C PHASE 3 | NUMBER: C-402

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DRAWN BY: NTG | CHECKED BY: WPS | SCALE: 1"=100'
PROJECT # 201044 | DATE: 01/15/2021

NRI000034

EROSION CONTROL LEGEND

- LIMITS OF CONSTRUCTION
- WBSF — WBSF — WIRE BACKED SILT FENCE
- CHECK DAM
- INLET PROTECTION
- LANDSCAPING/SUITABLE COVER

OUTFALL #	LATITUDE (N)	LONGITUDE (W)	APPROX. ELEV. (FEET)	PRE AREA (ACRES)	POST AREA (ACRES)	RECIEVING WATERS
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N

BEARING BASIS:
TENNESSEE STATE PLANE
COORDINATE SYSTEM - NAD 1983
VERTICAL DATUM - NAVD 1988

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SITE SPECIFIC EROSION CONTROL NOTES:

1. CONTRACTOR TO SOD ALL DISTURBED AREAS NOT OTHERWISE STABILIZED WITH LANDSCAPING (TYP.)

FLOODPLAIN NOTE:

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GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

COMMUNITY DEVELOPMENT ENTERPRISES
SITE PLAN
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

REVISIONS

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THE ENGINEER OR SURVEYOR OF RECORD IS
AFFIXED HERETO.

SHEET: E.P.S.C PHASE 3 | NUMBER: C-402

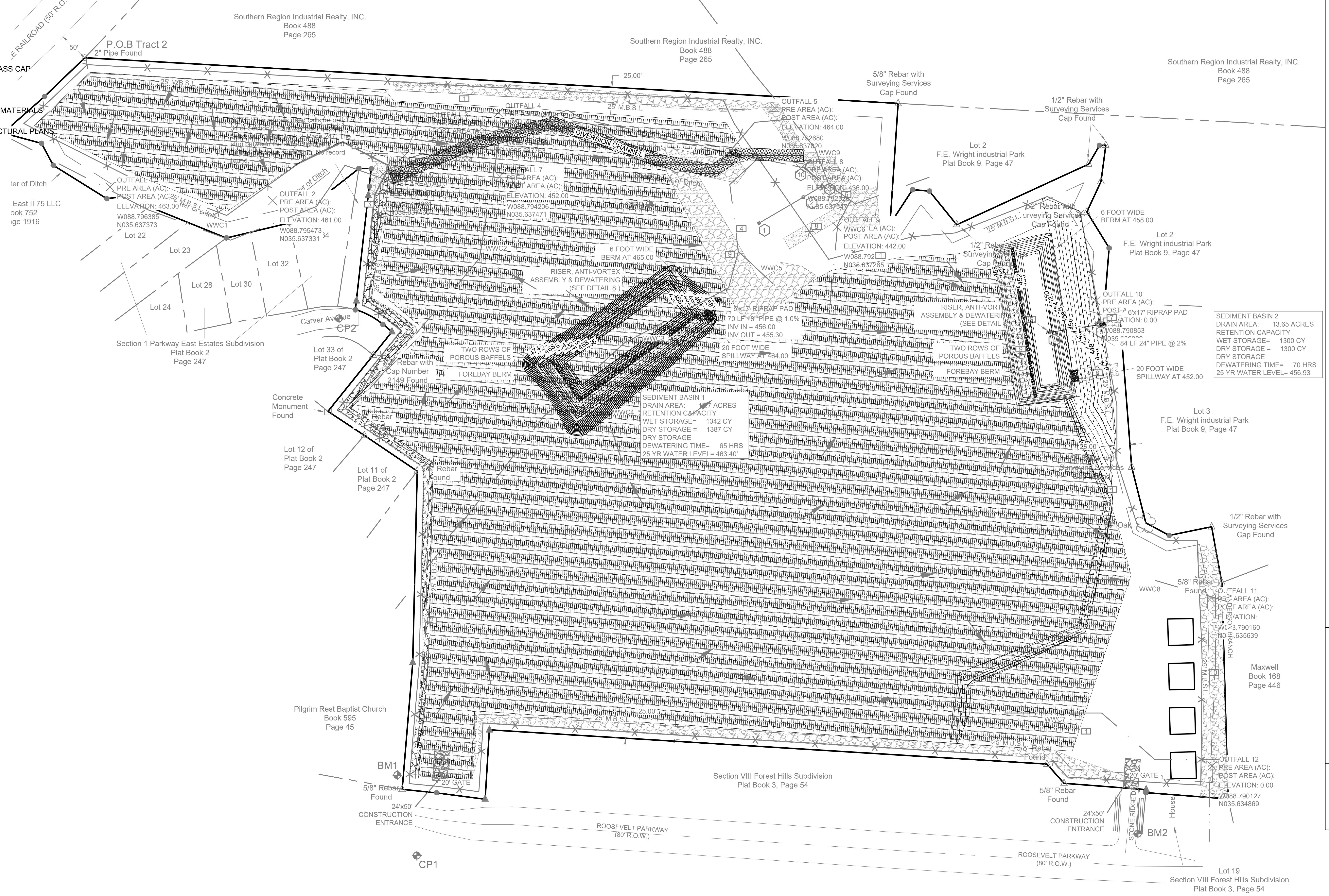
L.I. Smith and Associates, Inc.
LAND DEVELOPMENT | INFRASTRUCTURE DESIGN
SURVEYING SERVICES
302 North Caldwell Street, Paris, TN 38242 | 731-644-1014 | www.lismith.com
475 Metroplex Drive, Suite 212 Nashville, TN 37211 | 615-256-0290

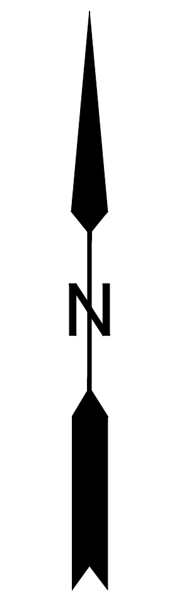
DRAWN BY: NTG	CHECKED BY: WPS	SCALE: 1"=100'
PROJECT # 201044		DATE: 01/15/2021

NRI000035

SITE SPECIFIC UTILITY NOTES:

1. POINT OF CONNECTION - GAS SERVICE (COORDINATE WITH UTILITY COMPANY PRIOR TO INSTALLATION)
2. PROPOSED GAS METER LOCATION AND SERVICE LINE (INSTALL BY GAS COMPANY) (GC TO OPEN & CLOSE DITCH)
3. POINT OF CONNECTION - WATER SERVICE (COORDINATE WITH UTILITY COMPANY PRIOR TO INSTALLATION TO DETERMINE SIZE OF EXISTING MAIN
4. INSTALL GATE VALVE & BOX (PER PVUD)
5. INSTALL DOMESTIC WATER METER IN PIT (PER PVUD)
6. INSTALL 2" RPBP IN ABOVE GROUND HEATED ENCLOSURE PER PVUD STANDARDS AND SPECS
7. INSTALL 2" DOMESTIC WATER SERVICE (PER PVUD)
8. POINT OF CONNECTION - 1-1/2" FORCE MAIN SERVICE (COORDINATE WITH UTILITY COMPANY PRIOR TO INSTALLATION) (CONTRACTOR TO VERIFY INVERT AND LOCATION PRIOR TO CONSTRUCTION)
9. INSTALL 3,000 GALLONS S.T.E.P. TANK, INV. IN = 720.62 (PER PVUD SPECS.) (S.T.E.P. SYSTEM DESIGN BY PVUD - COORDINATE & VERIFY SIZE AND DIMENSIONS WITH PVUD PLANS PRIOR TO INSTALLATION) (MUST BE 2' MINIMUM FROM PROPERTY LINE) (S.T.E.P. TANK SYSTEM MUST BE INSTALLED BY A PVUD APPROVED CONTRACTOR)
10. INSTALL 2,000 GALLONS S.T.E.P. TANK WITH DUPLEX 35 GPM WITH 1HP-230 V MOTORS AND THE DUPLEX CONTROL PANELS, INV. IN = 720.30 (PER PVUD SPECS.) (THE ELECTRICAL REQUIREMENTS WILL BE A 60AMP DEDICATED CIRCUIT WITH A DISCONNECT AT THE CONTROL PANEL MOUNTING STRUCTURE. THIS STRUCTURE WILL BE BUILT OF UNI-STRUT MATERIAL AND SHALL BE WITHIN 4' OF THE PUMP SYSTEM. THE TANKS MUST BE PROTECTED FROM TRAFFIC BY PVUD APPROVED METHOD.) (INSTALL REMOTE ALARM PANEL INSIDE BUILDING NEAR MANAGER'S OFFICE) (THE TOP OF PUMP TANK SHALL BE A MAXIMUM OF 2' BELOW FINISHED GRADE) (IF THE PRIMARY TANK WILL NOT GRAVITY FLOW TO THE DOSING TANK, AN ADDITIONAL PUMP WILL BE REQUIRED IN THE PRIMARY TANK) (MUST BE 2' MINIMUM FROM PROPERTY LINE) (THE S.T.E.P. SEWER SYSTEM MUST BE INSTALLED BY AN APPROVED INSTALLER) (S.T.E.P. SYSTEM DESIGN BY PVUD - COORDINATE & VERIFY SIZE AND DIMENSIONS WITH PVUD PLANS PRIOR TO INSTALLATION) (S.T.E.P. TANK SYSTEM MUST BE INSTALLED BY A PVUD APPROVED CONTRACTOR)
11. INSTALL 8 L.F. OF 4" SDR 35 PVC @ 1.0%
12. INSTALL 56 L.F. OF 4" SDR 35 PVC @ 1.0%
13. INSTALL 84 L.F. OF 4" SDR 35 PVC @ 1.0%
14. INSTALL TWO-WAY CLEANOUT WITH FLUSH BRASS CAP
15. INSTALL CLEANOUT
16. SAW CUT PAVEMENT AND REPLACE WITH LIKE MATERIALS
17. INSTALL GREASE INTERCEPTOR PER ARCHITECTURAL PLANS





BEARING BASIS:
TENNESSEE STATE PLANE
COORDINATE SYSTEM - NAD 1983
VERTICAL DATUM - NAVD 1988

	PROPERTY LINE		GUY WIRE
	PROPERTY ADJOINER LINE		LIGHT POLE
	EASEMENT LINE (ESMT)		POWER POLE
	CENTERLINE OF ROAD	TR	ELECTRICTRANSFORMER
W	WATER LINE	W	WATER METER
G	GAS LINE	W	WATER VALVE
OE	OVERHEAD UTILITY LINE	G	NATURAL GAS METER
SS	SEWER LINE	G	NATURAL GAS VALVE
SD	STORM DRAIN LINE	SD	STORM MANHOLE
	OVERHEAD COMS LINE	CB	CATCH BASIN
	FLOW LINE	CO	CLEANOUT
	DRAIN AREA LINE		SIGN
△	REBAR FOUND	⊗PED	TELEPHONE PEDESTAL
▲	5/8" REBAR WITH L.I. SMITH CAP SET		FIRE HYDRANT
●	UNMARKED POINT	S	SEWER MANHOLE
	BENCHMARK	✳	DECIDUOUS TREE
☐	CONCRETE SURFACE		EVERGREEN TREE
▨	ASPHALT SURFACE		

UTILITY NOTES:

1. SANITARY SEWER CONSTRUCTION SHALL COMPLY WITH PLEASANT VIEW UTILITY DISTRICT (PVUD) STANDARDS.
2. WATER CONSTRUCTION SHALL COMPLY WITH PLEASANT VIEW UTILITY DISTRICT (PVUD) STANDARDS.
3. A MINIMUM SEPARATION OF 18" IS REQUIRED AT ANY LOCATION WHERE A WATER LINE CROSSES A SANITARY SEWER LINE. IF THIS SEPARATION CANNOT FEASIBLY BE OBTAINED. THE WATER LINE MUST BE INSTALLED IN SUCH A MANNER THAT NO JOINT IS WITHIN 5' OF THE SANITARY SEWER LINE AND A SEPARATION OF 6" MUST BE MAINTAINED. BOTH LINES MUST BE DUCTILE IRON PIPE.
4. A MINIMUM SEPARATION OF 18" IS REQUIRED AT ANY LOCATION WHERE A WATER LINE CROSSES A STORM DRAINAGE LINE.
5. WATER/SEWER LINE TRENCHES IN EXISTING DRIVEWAYS OR STREETS SHALL BE BACKFILLED WITH CRUSHED STONE TO THE TOP OF THE TRENCH.
6. SEWER LINE TRENCHES OUTSIDE EXISTING DRIVEWAYS OR STREETS SHALL BE BACKFILLED WITH #57 CRUSHED STONE TO 6" ABOVE THE PIPE AND BACKFILLED WITH A MIXTURE OF CLEAN EARTH, FREE OF ROCK NO LARGER THAN 1' SQ. AND DEBRIS, FROM THAT POINT TO THE TOP OF THE TRENCH, WHERE THE UTILITIES ARE LOCATED BENEATH OR NEAR PAVEMENT, BACKFILL THE TRENCHES WITH CRUSHED STONE TO SUBGRADE.
7. WATER LINES 4" OR LARGER TO BE PRESSURE CLASS 52 DUCTILE CAST IRON PIPE MADE OF GOOD QUALITY DUCTILE IRON THAT MEETS THE REQUIREMENTS FOR MODULAR IRON CASTINGS OF ASTM E8. IT SHALL BE PLAIN END DUCTILE IRON PIPE WITH PUSH-ON, SINGLE GASKET JOINTS. THE DESIGN THICKNESS SHALL BE THAT AS SPECIFIED BY AWWA C 151.
8. WATER LINES LESS THAN 3" SHALL BE REHAU-MUNICIPEX WITH STAINLESS STEEL INSERTS ON CITY SIDE OF METER, DEPTH OF PIPE IS TO BE NO LESS THAN 36" AND NO MORE THAN 42" UNDERGROUND. ON CUSTOMER SIDE OF METER, WATER LINES LESS THAN 3" TO BE REHAU-MUNICIPEX WITH STAINLESS STEEL INSERTS.
9. ALL WATER AND SANITARY LEADS TO BUILDING SHALL END 5' OUTSIDE THE BUILDING LIMITS AS SHOWN ON PLAN AND SHALL BE PROVIDED WITH A TEMPORARY PLUG AT END.
10. TELEPHONE UTILITY CONSTRUCTION SHALL COMPLY WITH AT&T SPECIFICATIONS.
11. ELECTRIC UTILITY CONSTRUCTION SHALL COMPLY WITH CUMBERLAND ELECTRIC MEMBERSHIP CORPORATION (CEMC) SPECIFICATIONS.
12. GENERAL CONTRACTOR SHALL FURNISH (1) - 4" SCHEDULE 40 PVC, ELECTRICAL GRADE CONDUIT FOR TELEPHONE SERVICE, REFERENCE PLAN FOR LOCATION. VERIFY LOCATION OF TIE IN FOR TELEPHONE COMPANY'S SERVICE LINE. PROVIDE NYLON PULL CORDS INSIDE CONDUIT. PROVIDE 1-30" SWEEP UP TO BACKER BOARD WITH #6 GROUND FROM ELECTRIC PANEL. AT&T TO PROVIDE AND PULL TELEPHONE WIRE. BACKER BOARD SHALL BE 3/4" FIRE RETARDANT PLYWOOD. PROVIDE 120V OUTLET WITHIN 6 FEET OF BACKER BOARD
13. REFER TO SITE ELECTRICAL PLANS FOR NUMBER AND SIZE OF CONDUITS FOR SECONDARY ELECTRIC SERVICE. CONDUIT SHALL BE INSTALLED AT LOCATIONS SHOWN ON THE SITE ELECTRICAL PLANS WITH MINIMUM COVER BELOW FINISHED GRADE, PER CODES AND CUMBERLAND ELECTRIC MEMBERSHIP CORP., WITH MULE TAPE PROVIDED IN CONDUIT. NO MORE THAN ONE SWEEP BEND OF 15' MINIMUM RADIUS WILL BE ALLOWED IN A CONDUIT RUN. CONDUITS SHALL BE BACKFILLED WITH MATERIAL FREE FROM STONES, ROCK, OR OTHER MATERIAL WHICH COULD DAMAGE THE CONDUIT AND NO MATERIAL LARGER THAN 2 INCHES. TRENCHES IN PAVED AREAS SHALL BE BACKFILLED WITH #67 STONE. LENGTH OF THE CONDUIT SHALL EXTEND TO 2 FEET BEYOND THE CURB AND GUTTER OR SIDEWALK UNLESS OTHERWISE INDICATED ON THE PLANS AND ENDS TAPED W/ DUCT TAPE. THE CONTRACTOR SHALL MARK LOCATIONS OF BURIED CONDUIT BY A SCORE LINE IN THE TOP OF THE CURB DURING PAVING OPERATIONS. GROUND WIRE AND WARNING TAPE TO BE INSTALLED IN TRENCH WITH CONDUIT. INSTALL UNDERGROUND ELECTRIC SERVICE PER CUMBERLAND ELECTRIC MEMBERSHIP CORP. SPECIFICATIONS.
14. PRIMARY ELECTRIC SERVICE SHALL BE 2-4" SCHEDULE 80 PVC, ELECTRICAL GRADE CONDUITS. CONDUIT SHALL BE INSTALLED AT LOCATIONS SHOWN ON THE SITE ELECTRICAL PLANS WITH MINIMUM COVER BELOW FINISHED GRADE, PER CODES AND CUMBERLAND ELECTRIC MEMBERSHIP CORP., WITH MULE TAPE PROVIDED IN CONDUIT. NO MORE THAN ONE SWEEP BEND OF 15' MINIMUM RADIUS WILL BE ALLOWED IN A CONDUIT RUN. CONDUITS SHALL BE BACKFILLED WITH MATERIAL FREE FROM STONES, ROCK, OR OTHER MATERIAL WHICH COULD DAMAGE THE CONDUIT AND NO MATERIAL LARGER THAN 2 INCHES. TRENCHES IN PAVED AREAS SHALL BE BACKFILLED WITH #67 STONE. LENGTH OF THE CONDUIT SHALL EXTEND TO 2 FEET BEYOND THE CURB AND GUTTER OR SIDEWALK UNLESS OTHERWISE INDICATED ON THE PLANS AND ENDS TAPED W/ DUCT TAPE. THE CONTRACTOR SHALL MARK LOCATIONS OF BURIED CONDUIT BY A SCORE LINE IN THE TOP OF THE CURB DURING PAVING OPERATIONS. GROUND WIRE AND WARNING TAPE TO BE INSTALLED IN TRENCH WITH CONDUIT. INSTALL UNDERGROUND ELECTRIC SERVICE PER CUMBERLAND ELECTRIC MEMBERSHIP CORP. SPECIFICATIONS.
15. GENERAL CONTRACTOR SHALL HAVE APPROVAL OF ALL GOVERNING AGENCIES HAVING JURISDICTION OVER THIS SYSTEM PRIOR TO INSTALLATION.
16. ALL APPROPRIATE FEES SHALL BE PAID PRIOR TO BEGINNING SITE UTILITY CONSTRUCTION.
17. GENERAL CONTRACTOR WILL BE RESPONSIBLE FOR ALL TAP AND TIE ON FEES REQUIRED, AS WELL AS COST OF UNDERGROUND SERVICE CONNECTIONS TO THE BUILDING.
18. ALL TRENCHING, PIPE LAYING, AND BACKFILLING SHALL BE IN ACCORDANCE WITH FEDERAL OSHA REGULATIONS.
19. THE OWNER / DEVELOPER, FOR BUDGET PURPOSES, SHOULD CHECK WITH THE TOWN OF PLEASANT VIEW PUBLIC WORKS FOR CONNECTION FEES WHICH MAY BE SUBSTANTIAL.
20. CONTRACTORS FOR SEWER WORK MUST BE APPROVED BY THE TOWN OF PLEASANT VIEW PUBLIC WORKS.

TRAFFIC CONTROL NOTES:

1. WHENEVER CONSTRUCTION OPERATIONS ENCROACH ON THE RIGHT-OF-WAY OF ADJACENT ROADWAYS, TRAFFIC CONTROL SHALL BE PROVIDED IN ACCORDANCE WITH LOCAL AND STATE STANDARDS.
2. NO MATERIALS OR EQUIPMENT SHALL BE STORED OR STOCKPILED WITHIN THE RIGHT-OF-WAY OF ADJACENT ROADWAYS.
3. ALL TRAFFIC CONTROL, INCLUDING MARKINGS, SIGNS, ETC. SHALL FOLLOW THE CURRENT EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
4. EXCAVATION AND LANE CLOSURE PERMITS ARE REQUIRED FOR ALL WORK DONE WITHIN THE PUBLIC RIGHT-OF-WAY.

HVAC NOTE:

HVAC UNITS ARE LOCATED ON THE ROOF.

FLOODPLAIN NOTE:

THE SITE IS LOCATED IN UNSHADED FLOOD ZONE "X", AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS DETERMINED BY THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP NO. 471130168E, DATED AUGUST 03, 2009.

GRAPHIC SCALE

(IN FEET)
1 inch = 100 ft.

COMMUNITY DEVELOPMENT ENTERPRISES
SITE PLAN
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

REVISIONS

THIS DRAWING SHALL BE CONSIDERED PRELIMINARY IN NATURE AND, IN NO WAY, FINAL OR COMPLETE, UNLESS THE SEAL OF THE ENGINEER OR SURVEYOR OF RECORD IS AFFIXED HERETO.

SHEET: UTILITIES

NUMBER: C-500

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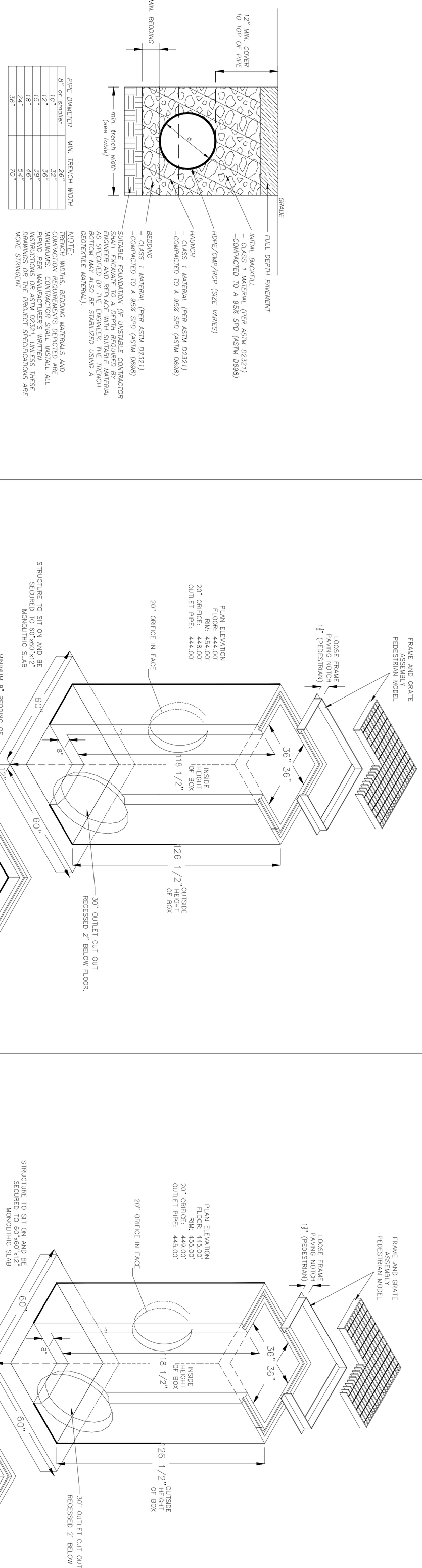
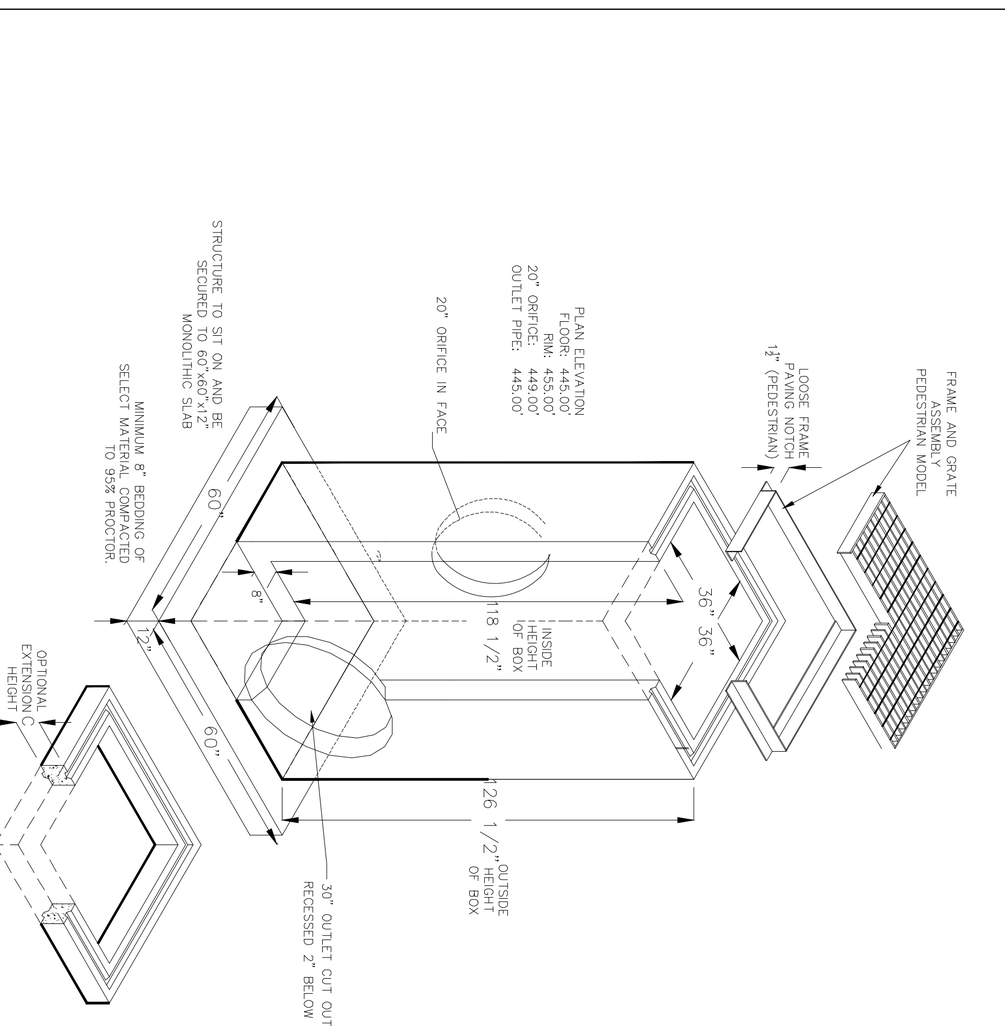
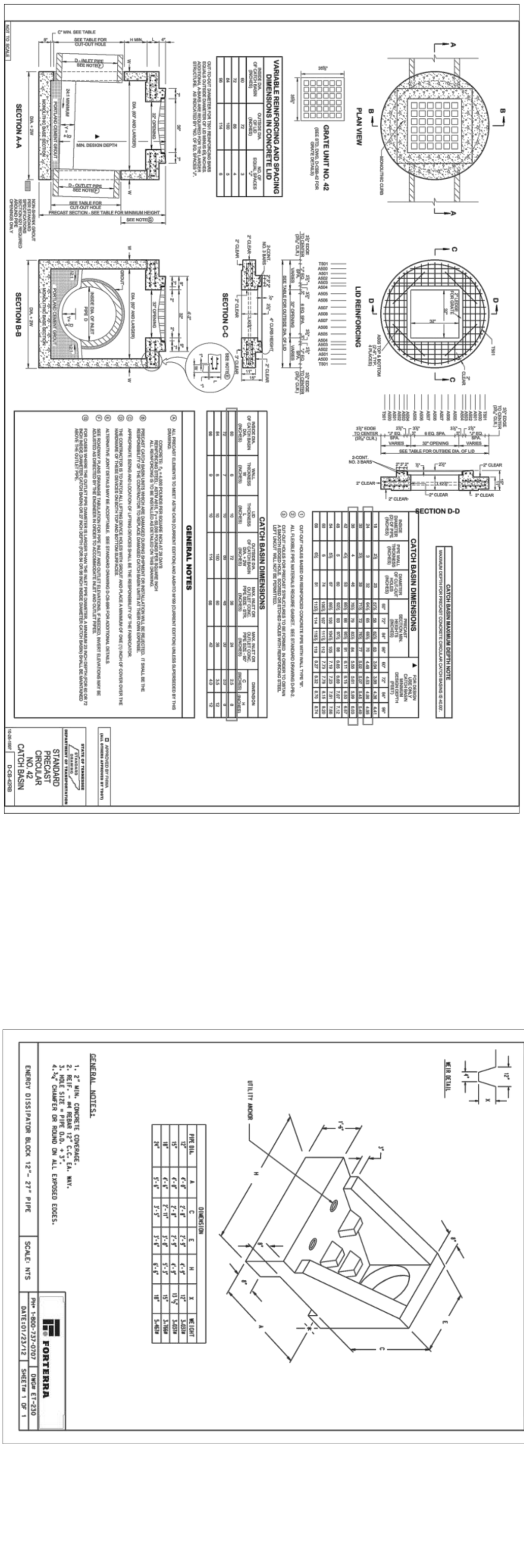


PIPE DIAMETER	MIN. TRENCH WIDTH
8" or smaller	26"
10"	32"
12"	36"
15"	39"
18"	46"
24"	54"
36"	70"

NOTE:
TRENCH WIDTHS, BEDDING MATERIALS AND COMPACTION REQUIREMENTS DEPICTED ARE MINIMUMS. CONTRACTOR SHALL INSTALL ALL PIPING PER MANUFACTURER'S WRITTEN INSTRUCTIONS OR ASTM D2321, UNLESS THESE DRAWINGS OR THE PROJECT SPECIFICATIONS ARE MORE STRINGENT.




NOT TO SCALE
SECTION A-A
SECTION B-B
SECTION C-C
SECTION D-D
PLAN VIEW
LID REINFORCING
GRATE UNIT NO. 42
(SEE STD. DWG. D-CSB-42 FOR GRATE DETAILS)
MONOLITHIC CURB
MIN. DESIGN DEPTH
PORTLAND CEMENT GROUT
MONOLITHIC BASE SECTION
NON-SHRINK GROUT (SEE SPECIFICATIONS SECTION 921 REQUIRED FOR PIPE OPENING ONLY)
SEE NOTE ⑥
SEE TABLE FOR PRECAST SECTION - SEE TABLE FOR MINIMUM HEIGHT
SEE TABLE FOR CUT-OUT HOLE
C MIN. SEE TABLE
H MIN.
L
4"
6"
W
D1 INLET PIPE SEE NOTE ②
D2 OUTLET PIPE SEE NOTE ③
24:1 MINIMUM
y = D/2
DIA. (60" AND LARGER)
32" OPENING
36"
7"
INSIDE DIA. OF INLET PIPE D
GROUT
2-CONT. NO. 3 BARS
4" CURB HEIGHT
2" CLEAR
3" CLEAR
SEE NOTE ⑤
3½" EDGE TO CENTER (3½" CLR.)
2½" TYP.
6 EQ. SPA.
VARIES
32" OPENING
SEE TABLE FOR OUTSIDE DIA. OF LID
3½" EDGE TO CENTER (3½" CLR.)
T501
A502
A503
A504
A505
A506
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A508
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A538
A539
A540
A541

STD-17-03(R3)-BARREL_ASSY.DGN

1 @ 8'x6' REINFORCED CONCRETE BOX BRIDGE

Maximum Fill Height ft.	Dimensions				Bars T1&T2				Bars B1&B2				Bars E1&E2				Bars L&W1	Bars L&W2	Bars V1&V2	Concrete	Rebar
	SIT ft.	SAB in.	WT in.	BW ft.	Size No.	Spacing in.	Length ft.	Bent Dim.	Size No.	Spacing in.	Length ft.	Bent Dim.	Size No.	Spacing in.	Length ft.	Bent Dim.	No.	No.	No.	CY/LF	LBS/LF
0	0.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
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35	1.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
40	1.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
45	1.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
50	1.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
55	1.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
60	1.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
0	2.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
5	2.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
10	2.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
15	2.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
20	2.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
25	2.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
30	2.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
35	2.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
40	2.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
45	2.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
50	2.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
55	2.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
60	2.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
0	2.33	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
5	2.33	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
10	2.33	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
15	2.33	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
20	2.33	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
25	2.33	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
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45	2.33	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
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55	2.33	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
60	2.33	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
0	2.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
5	2.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
10	2.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
15	2.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
20	2.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
25	2.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
30	2.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
35	2.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
40	2.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
45	2.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
50	2.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
55	2.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
60	2.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
0	3.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
5	3.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
10	3.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
15	3.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
20	3.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
25	3.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
30	3.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
35	3.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
40	3.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
45	3.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
50	3.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
55	3.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
60	3.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
0	3.33	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
5	3.33	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
10	3.33	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
15	3.33	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
20	3.33	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
25	3.33	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
30	3.33	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
35	3.33	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
40	3.33	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
45	3.33	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
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5	3.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
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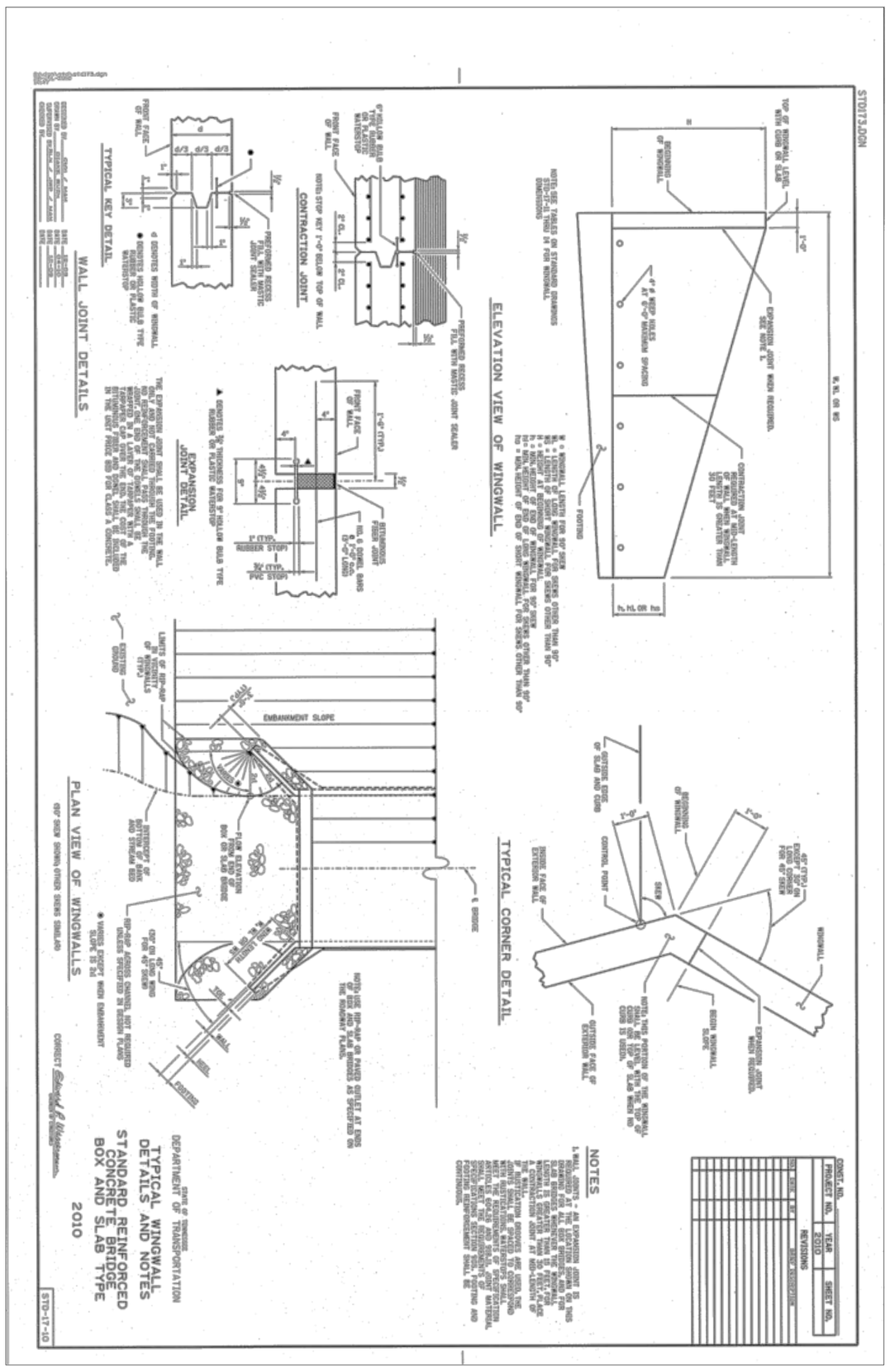
15	3.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
20	3.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
25	3.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
30	3.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
35	3.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
40	3.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
45	3.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
50	3.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
55	3.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
60	3.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
0	4.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
5	4.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
10	4.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
15	4.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
20	4.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
25	4.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
30	4.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
35	4.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
40	4.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
45	4.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
50	4.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
55	4.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192
60	4.00	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	6.83	1	10	54	4	0.80	192

1 @ 8'x7' REINFORCED CONCRETE BOX BRIDGE

Maximum Fill Height ft.	Dimensions				Bars T1&T2				Bars B1&B2				Bars E1&E2				Bars L&W1	Bars L&W2	Bars V1&V2	Concrete	Rebar
	SIT ft.	SAB in.	WT in.	BW ft.	Size No.	Spacing in.	Length ft.	Bent Dim.	Size No.	Spacing in.	Length ft.	Bent Dim.	Size No.	Spacing in.	Length ft.	Bent Dim.	No.	No.	No.	CY/LF	LBS/LF
0	0.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	7.83	1	10	58	4	0.91	198
5	0.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	7.83	1	10	58	4	0.91	198
10	0.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	7.83	1	10	58	4	0.91	198
15	0.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	7.83	1	10	58	4	0.91	198
20	0.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	7.83	1	10	58	4	0.91	198
25	0.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	7.83	1	10	58	4	0.91	198
30	0.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1	4	12	7.83	1	10	58	4	0.91	198
35	0.67	11	10	0.83	4	12	6.83	1	4	12	6.83	1



45° SKEW

2:1 SLOPE

H	WL	hi	WS	ho	CONCRETE C.Y.	REINF. STEEL LBS.
4	5.75	2.50	4.50	1.75	4.9	720
4.5	11.00	2.75	5.40	1.75	5.8	782
5	21.25	3.25	5.40	2.00	7.6	886
5.5	23.75	3.50	6.45	2.25	9.1	1,007
6	25.00	3.75	6.45	2.50	10.3	1,102
6.5	31.75	4.00	7.05	2.75	12.1	1,256
7	33.00	4.25	7.05	3.00	13.4	1,364
7.5	34.25	4.50	7.65	3.25	14.8	1,478
8	35.50	4.75	7.65	3.50	16.1	1,591
8.5	41.50	5.00	8.25	3.75	17.8	1,751
9	43.00	5.25	8.25	4.00	19.2	1,878
9.5	44.50	5.50	8.85	4.25	20.7	2,010
10	46.00	5.75	8.85	4.50	22.2	2,142
10.5	47.50	6.00	9.45	4.75	23.8	2,279
11	49.00	6.25	9.45	5.00	25.4	2,416
11.5	50.50	6.50	10.05	5.25	27.1	2,558
12	52.00	6.75	10.05	5.50	28.8	2,700
12.5	53.50	7.00	10.65	5.75	30.6	2,847
13	55.00	7.25	10.65	6.00	32.4	2,994
13.5	56.50	7.50	11.25	6.25	34.3	3,146
14	58.00	7.75	11.25	6.50	36.2	3,298
14.5	59.50	8.00	11.85	6.75	38.2	3,455
15	61.00	8.25	11.85	7.00	40.2	3,612
15.5	62.50	8.50	12.45	7.25	42.3	3,774
16	64.00	8.75	12.45	7.50	44.4	3,936
16.5	65.50	9.00	13.05	7.75	46.6	4,103
17	67.00	9.25	13.05	8.00	48.8	4,270
17.5	68.50	9.50	13.65	8.25	51.1	4,442
18	70.00	9.75	13.65	8.50	53.4	4,614
18.5	71.50	10.00	14.25	8.75	55.8	4,791
19	73.00	10.25	14.25	9.00	58.2	4,968
19.5	74.50	10.50	14.85	9.25	60.7	5,150
20	76.00	10.75	14.85	9.50	63.2	5,332
20.5	77.50	11.00	15.45	9.75	65.8	5,519
21	79.00	11.25	15.45	10.00	68.4	5,706

3:1 SLOPE

H	WL	hi	WS	ho	CONCRETE C.Y.	REINF. STEEL LBS.
4	11.25	3.00	5.40	2.00	6.0	758
4.5	12.75	3.25	6.05	2.25	7.3	846
5	14.25	3.50	6.05	2.50	8.4	947
5.5	15.75	3.75	6.65	2.75	9.8	1,067
6	17.25	4.00	7.25	3.00	11.0	1,172
6.5	18.75	4.25	7.85	3.25	12.5	1,316
7	20.25	4.50	8.45	3.50	14.0	1,460
7.5	21.75	4.75	8.45	3.75	15.6	1,604
8	23.25	5.00	9.05	4.00	17.2	1,748
8.5	24.75	5.25	9.65	4.25	18.9	1,897
9	26.25	5.50	9.65	4.50	20.6	2,046
9.5	27.75	5.75	10.25	4.75	22.4	2,200
10	29.25	6.00	10.25	5.00	24.2	2,354
10.5	30.75	6.25	10.85	5.25	26.1	2,513
11	32.25	6.50	10.85	5.50	28.0	2,672
11.5	33.75	6.75	11.45	5.75	30.0	2,836
12	35.25	7.00	11.45	6.00	32.0	3,000
12.5	36.75	7.25	12.05	6.25	34.1	3,169
13	38.25	7.50	12.05	6.50	36.2	3,338
13.5	39.75	7.75	12.65	6.75	38.4	3,512
14	41.25	8.00	12.65	7.00	40.6	3,686
14.5	42.75	8.25	13.25	7.25	42.9	3,865
15	44.25	8.50	13.25	7.50	45.2	4,044
15.5	45.75	8.75	13.85	7.75	47.5	4,228
16	47.25	9.00	13.85	8.00	49.9	4,412
16.5	48.75	9.25	14.45	8.25	52.4	4,601
17	50.25	9.50	14.45	8.50	54.9	4,790
17.5	51.75	9.75	15.05	8.75	57.4	4,984
18	53.25	10.00	15.05	9.00	60.0	5,178
18.5	54.75	10.25	15.65	9.25	62.7	5,377
19	56.25	10.50	15.65	9.50	65.4	5,576
19.5	57.75	10.75	16.25	9.75	68.2	5,780
20	59.25	11.00	16.25	10.00	71.0	5,984
20.5	60.75	11.25	16.85	10.25	73.9	6,193
21	62.25	11.50	16.85	10.50	76.8	6,402

4:1 SLOPE

H	WL	hi	WS	ho	CONCRETE C.Y.	REINF. STEEL LBS.
4	10.25	3.25	6.50	2.25	6.3	835
4.5	11.75	3.50	7.20	2.75	8.3	897
5	16.50	4.00	8.00	3.00	10.7	1,023
5.5	17.00	4.25	9.00	3.25	12.5	1,235
6	18.75	4.75	9.70	3.50	14.7	1,360
6.5	20.25	5.25	10.40	3.75	17.4	1,474
7	21.75	5.50	11.10	4.00	20.6	1,685
7.5	23.50	6.00	12.20	4.50	23.8	2,029
8	25.00	6.25	13.00	4.75	25.7	2,483
8.5	26.50	6.50	13.70	5.00	28.3	2,615
9	28.00	6.75	14.40	5.00	29.7	3,073
9.5	29.50	7.00	15.10	5.25	32.5	3,189
10	31.00	7.25	15.80	5.50	35.3	3,418
10.5	32.50	7.50	16.50	5.75	38.3	3,647
11	34.00	7.75	17.20	6.00	41.4	3,876
11.5	35.50	8.00	17.90	6.25	44.5	4,105
12	37.00	8.25	18.60	6.50	47.7	4,334
12.5	38.50	8.50	19.30	6.75	51.0	4,563
13	40.00	8.75	20.00	7.00	54.4	4,792
13.5	41.50	9.00	20.70	7.25	57.8	5,021
14	43.00	9.25	21.40	7.50	61.3	5,250
14.5	44.50	9.50	22.10	7.75	64.9	5,479
15	46.00	9.75	22.80	8.00	68.5	5,708
15.5	47.50	10.00	23.50	8.25	72.2	5,937
16	49.00	10.25	24.20	8.50	75.9	6,166
16.5	50.50	10.50	24.90	8.75	79.7	6,395
17	52.00	10.75	25.60	9.00	83.6	6,624
17.5	53.50	11.00	26.30	9.25	87.5	6,853
18	55.00	11.25	27.00	9.50	91.5	7,082
18.5	56.50	11.50	27.70	9.75	95.5	7,311
19	58.00	11.75	28.40	10.00	99.6	7,540
19.5	59.50	12.00	29.10	10.25	103.8	7,769
20	61.00	12.25	29.80	10.50	108.0	7,998
20.5	62.50	12.50	30.50	10.75	112.2	8,227
21	64.00	12.75	31.20	11.00	116.5	8,456

6:1 SLOPE

H	WL	hi	WS	ho	CONCRETE C.Y.	REINF. STEEL LBS.
4	13.50	3.50	7.60	2.75	7.8	947
4.5	15.00	3.75	8.50	3.00	9.4	946
5	16.75	4.00	9.00	3.50	10.2	1,099
5.5	18.50	4.75	10.00	3.75	11.4	1,304
6	20.25	5.00	11.00	4.00	11.4	1,462
6.5	22.00	5.00	12.00	4.50	20.0	1,884
7	23.50	6.00	13.00	4.75	23.4	1,990

STANDARD REINFORCED CONCRETE BRIDGE BOX AND SLAB TYPE
2010

DEPARTMENT OF TRANSPORTATION — STATE OF TENNESSEE

WINGWALL DIMENSIONS AND QUANTITIES

NOTE: QUANTITIES ON THIS SHEET ARE ESTIMATED TOTALS FOR ALL FOUR WINGWALLS.

NOTE: ADDITIONAL CONCRETE AND REINFORCEMENT QUANTITIES FOR BOX CULVERT CUT-OFF WALL SHALL BE ADDED AS REQUIRED BASED ON AS-BUILT CONDITIONS.

CONST. NO. | PROJECT NO. | YEAR 2010 | SHEET NO.

REVISIONS

NO. | DATE | BY | REVISION DESCRIPTION

CORRECT — Edward P. Abbott — CHIEF ENGINEER

STD-17-10

SHEET: SITE DETAILS | NUMBER: C-902

L.I. Smith and Associates, Inc.
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SURVEYING SERVICES

302 North Caldwell Street, Paris, TN 38242 ı 731-644-1014 ı www.lismith.com
475 Metroplex Drive, Suite 212 Nashville, TN 37211 ı 615-256-0290

DRAWN BY: NTG | CHECKED BY: WPS | SCALE:

PROJECT # 201044 | DATE: 01/15/2021

THIS DRAWING SHALL BE CONSIDERED PRELIMINARY IN NATURE AND, IN NO WAY, FINAL OR COMPLETE, UNLESS THE SEAL OF THE ENGINEER OR SURVEYOR OF RECORD IS AFFIXED HERETO.

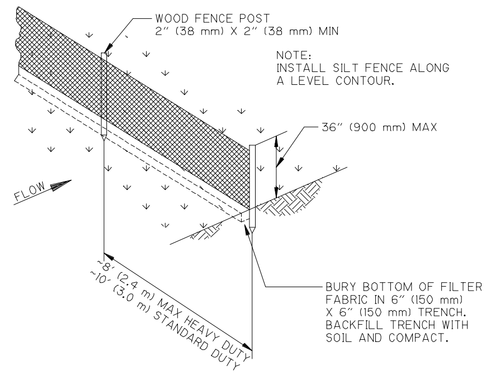
REVISIONS

COMMUNITY DEVELOPMENT ENTERPRISES
SITE PLAN
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

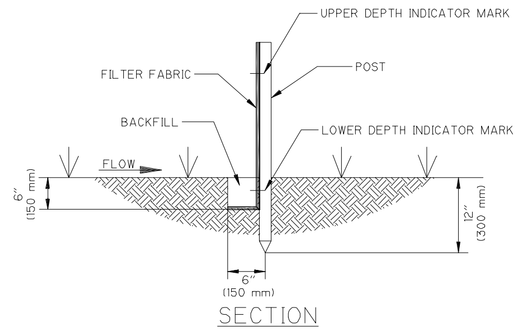
NRI000039

ACTIVITY: Silt Fence

TCP – 13



TYPICAL PREFABRICATED
SILT FENCE INSTALLATION
N.T.S.



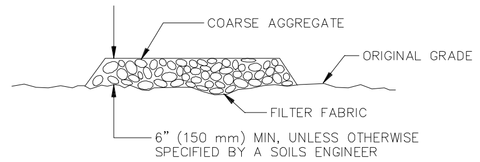
SECTION
N.T.S.

Figure TCP-13-1
Silt Fence Anchoring

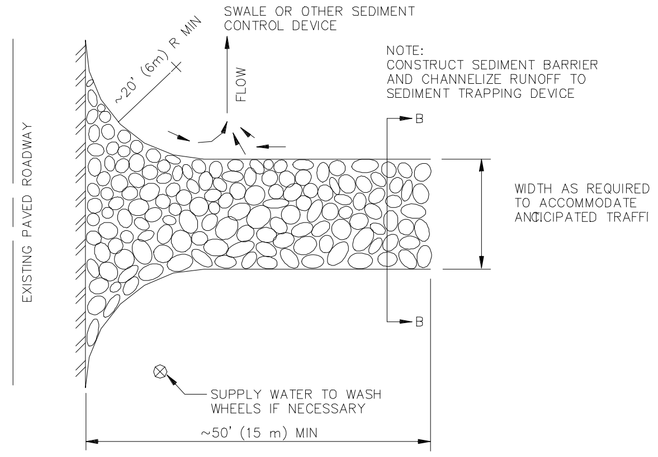
4.01 *SILT FENCE*
NO SCALE

ACTIVITY: Stabilized Construction Entrance

TCP – 03



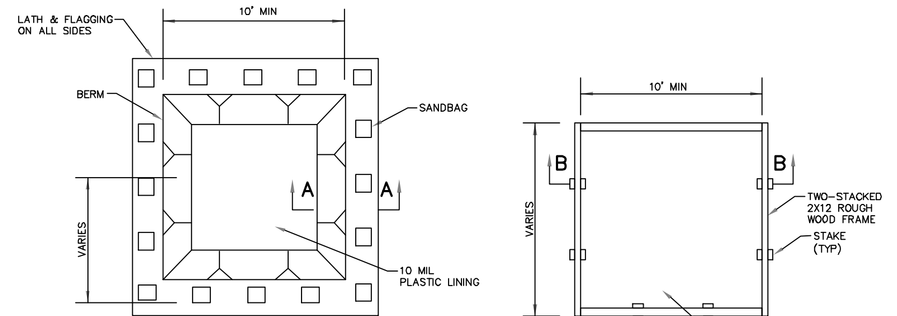
SECTION B–B
N.T.S.



PLAN VIEW
N.T.S.

Figure TCP-03-1
Stabilized Construction Entrance

4.02 *CONSTRUCTION ENTRNACE*
NO SCALE



CONCRETE WASHOUT
SIGN DETAIL
(OR EQUIVALENT)

MAINTENANCE
1. DRIED CONCRETE WASTE SHALL BE PICKED UP AND DISPOSED OF PROPERLY WHEN 75% OF CAPACITY IS REACHED.

2. HARDENED CONCRETE CAN BE PROPERLY RECYCLED AND REUSED ONSITE OR HAULED OFF-SITE TO AN APPROPRIATE FACILITY.

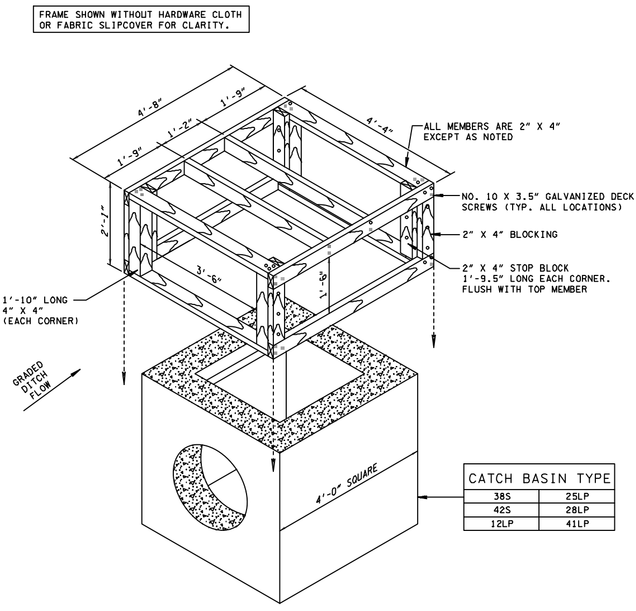
NOTES
1. ACTUAL LAYOUT DETERMINED IN FIELD.

2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30 FT. OF THE TEMPORARY CONCRETE WASHOUT FACILITY.

3. CONCRETE WASHOUT SHOULD NOT BE ALLOWED IN STREET OR TO REACH A STORM WATER DRAINAGE SYSTEM OR WATERCOURSE.

4. CONCRETE WASHOUT AREA TO BE LOCATED AT LEAST 10' BEHIND CURB IF ADJACENT TO A PAVED ROAD.

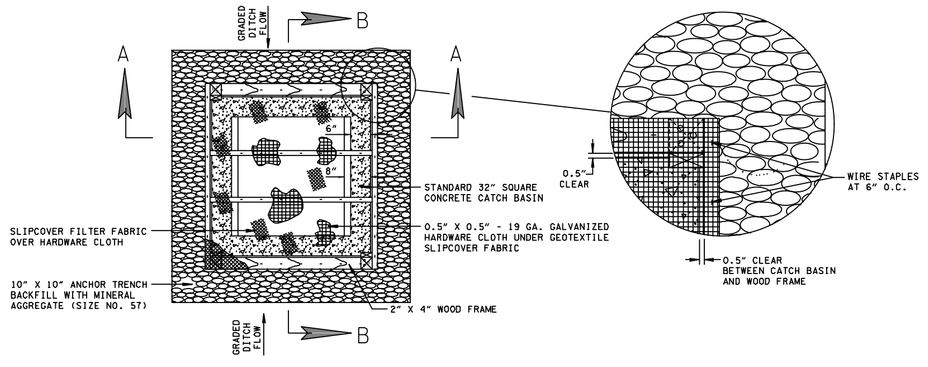
24 *CONCRETE WASHOUT*
NO SCALE



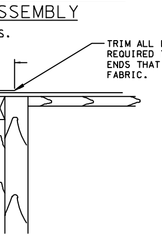
CATCH BASIN TYPE	
38S	25LP
42S	28LP
12LP	41LP

ISOMETRIC VIEW
CATCH BASIN FILTER ASSEMBLY
N.T.S.

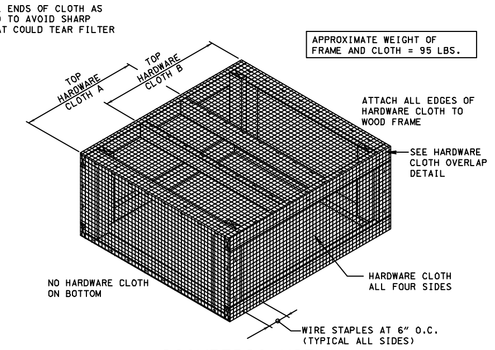
EROSION CONTROL PLAN LEGEND: ① CATCH BASIN FILTER ASSEMBLY (TYPE 1)



PLAN VIEW - CATCH BASIN
FILTER ASSEMBLY



HARDWARE CLOTH
OVERLAP DETAIL
N.T.S.



ISOMETRIC VIEW
FRAME WITH HARDWARE CLOTH
N.T.S.

INSTALLATION SEQUENCE FOR HARDWARE CLOTH

INSTALL TOP HARDWARE CLOTH A, PULL MATERIAL TIGHT, LAP AND STAPLE AS SHOWN. CUT TO LENGTH AND TRIM SHARP EDGES.

INSTALL TOP HARDWARE CLOTH B - OVERLAPPING CLOTH A. PULL CLOTH TIGHT, LAP, AND STAPLE AS SHOWN. CUT TO LENGTH AND TRIM ALL SHARP EDGES.

INSTALL HARDWARE CLOTH AROUND EXTERIOR OF WOOD FRAME USING ONE CONTINUOUS PIECE BEGINNING AT A CORNER, ENDING AT SAME CORNER, AND OVERLAPPING AS REQUIRED. PULL TIGHT AND STAPLE EACH SIDE BEFORE PROCEEDING WITH SUBSEQUENT SIDES.

TRIM EXCESS ALONG BOTTOM AS NECESSARY.

CATCH BASIN FILTER ASSEMBLY GENERAL NOTES

(A) DRAWING TO BE USED WITH STANDARD TYPES 38S, 42S, AND D-CB-SERIES LP CATCH BASINS. SEE STANDARD DRAWINGS FOR CATCH BASIN DIMENSIONS AND DETAILS.

(B) THE CATCH BASIN FILTER ASSEMBLY IS TO BE USED WHERE INTERCEPTION OF CONCENTRATED FLOWS (e.g. DITCHES AND SWALES) IS REQUIRED AFTER STRUCTURES ARE CONSTRUCTED BUT PRIOR TO ESTABLISHING VEGETATION.

(C) 2 x 4 AND 4 x 4 PRESSURE TREATED MEMBERS SHOWN ARE NOMINAL DIMENSIONS. TYPICAL ACTUAL DIMENSIONS ARE 1.5 x 3.5 INCH AND 3.5 x 3.5 INCH RESPECTIVELY. ACTUAL DIMENSIONS OF WOOD MAY VARY EVEN GREATER DEPENDING ON MOISTURE CONTENT. ALL WOOD SHALL BE NO. 2 PRESSURE TREATED SOUTHERN YELLOW PINE.

(D) PERIODIC MAINTENANCE AND CLEANING OF THE STRUCTURE SHALL BE PERFORMED AS NECESSARY TO PREVENT CLOGGING OF THE FILTER FABRIC. FILTER ASSEMBLY MAY BE CLEANED AT AN ACCEPTABLE LOCATION WITH WATER OR BY BRUSHING AND BLOWING CLEAN WITH COMPRESSED AIR. MAINTENANCE AND CLEANING OF STRUCTURES WILL NOT BE MEASURED AND PAID FOR DIRECTLY BUT SHALL BE INCLUDED IN THE PRICE BID FOR THE STRUCTURE.

CATCH BASIN FILTER ASSEMBLY GENERAL NOTES (CONT.)

(E) DEFECTIVE WOOD, HARDWARE CLOTH OR FILTER FABRIC SHALL BE REPLACED AS NECESSARY TO INSURE PROPER FUNCTIONING OF FILTER ASSEMBLY. REUSE OF ASSEMBLIES IS ACCEPTABLE PROVIDED THE UNIT IS IN PROPER WORKING CONDITION. APPROVAL MUST BE GIVEN BY TDOT ENGINEER.

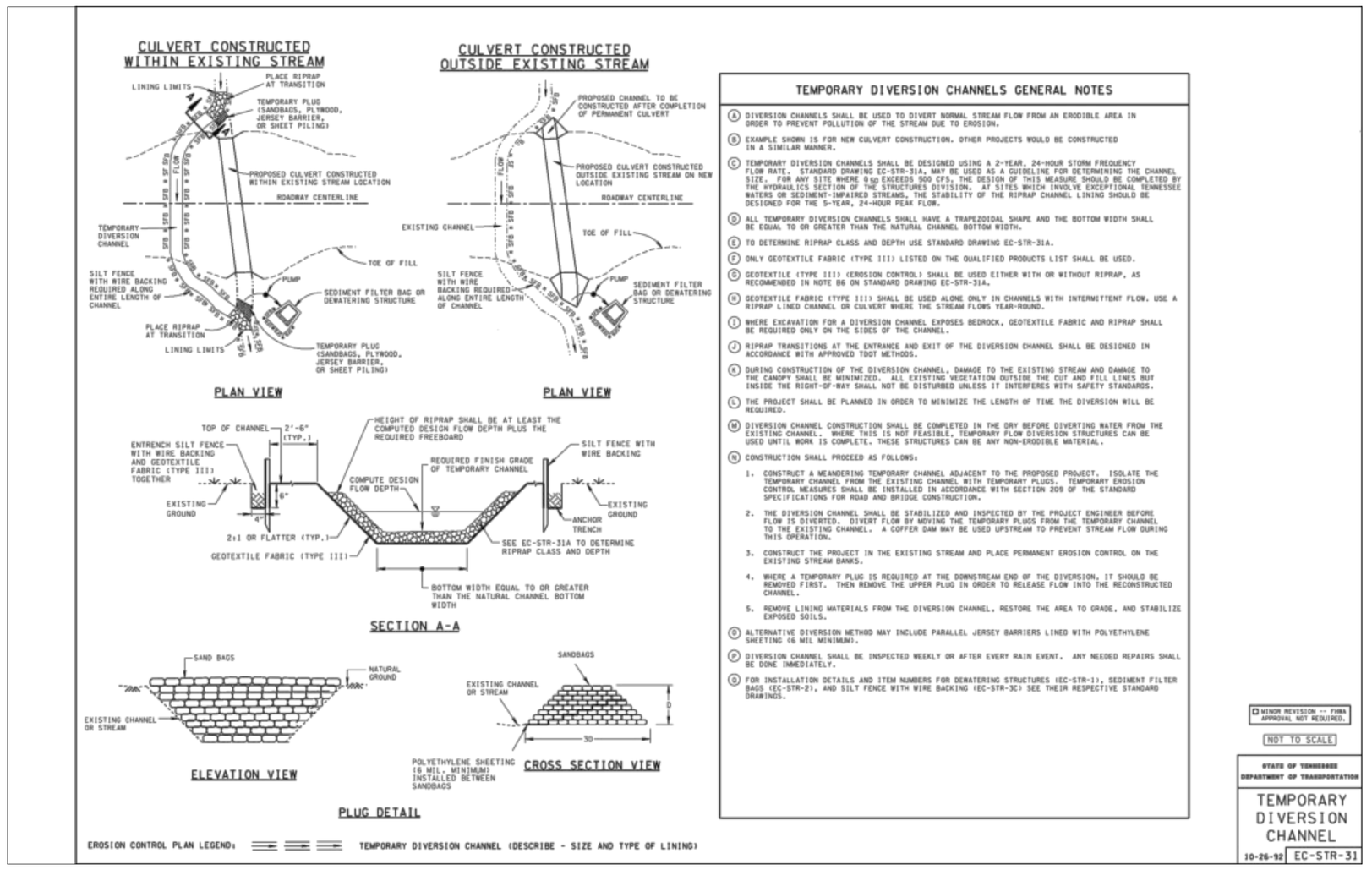
(F) ASSEMBLY AND STONE SHALL BE REMOVED AFTER UPSTREAM VEGETATION HAS BEEN ESTABLISHED OR OTHER SEDIMENT CONTROL STRUCTURES ARE IN PLACE. BACKFILL AND COMPACT ANCHOR TRENCH TO FINAL GRADE AS REQUIRED AFTER REMOVAL.

(G) IF NECESSARY, AT DIRECTION OF TDOT ENGINEER, SLIPCOVER MAY BE SECURED IN PLACE AT THE LOWEST PRACTICAL POINT WITH NYLON STRING, TWINE, WIRE OR OTHER SUITABLE MATERIAL.

(H) WHERE LARGE QUANTITIES OF SEDIMENT OR HIGH VELOCITIES OF APPROACHING WATER ARE ANTICIPATED DUE TO SPACING OF CATCH BASINS, DITCH GRADE, ETC...OTHER EROSION PREVENTION AND SEDIMENT CONTROL DEVICES MAY BE NECESSARY UPSTREAM OF FILTER ASSEMBLY.

(I) ALL LABOR AND MATERIALS NECESSARY TO CONSTRUCT AND INSTALL TEMPORARY CATCH BASIN FILTER ASSEMBLY INCLUDING TRENCHING, BACKFILLING, STONE, AND SLIPCOVER SHALL BE PAID FOR UNDER ITEM NUMBER 209-40.41, CATCH BASIN FILTER ASSEMBLY (TYPE 1), PER EACH.

4.04 *AREA INLET PROTECTION*
NO SCALE



TEMPORARY DIVERSION CHANNELS GENERAL NOTES

(A) DIVERSION CHANNELS SHALL BE USED TO DIVERT NORMAL STREAM FLOW FROM AN ERODIBLE AREA IN ORDER TO PREVENT POLLUTION OF THE STREAM DUE TO EROSION.

(B) EXAMPLE SHOWN IS FOR NEW CULVERT CONSTRUCTION. OTHER PROJECTS WOULD BE CONSTRUCTED IN A SIMILAR MANNER.

(C) TEMPORARY DIVERSION CHANNELS SHALL BE DESIGNED USING A 2-YEAR, 24-HOUR STORM FREQUENCY FLOW RATE. STANDARD DRAWING EC-STR-31A, MAY BE USED AS A GUIDELINE FOR DETERMINING THE CHANNEL SIZE. FOR ANY SITE WHERE Q DO EXCEEDS 500 CFS, THE DESIGN OF THIS MEASURE SHOULD BE COMPLETED BY A HYDRAULICS SECTION OF THE STRUCTURES DIVISION. AT SITES WHICH INVOLVE EXCEPTIONAL TENNESSEE RIVERS OR STREAMS OR WHERE THE FAILURE OR INSTABILITY OF THE RIPRAP CHANNEL LINING SHOULD BE DESIGNED FOR THE 5-YEAR, 24-HOUR PEAK FLOW.

(D) ALL TEMPORARY DIVERSION CHANNELS SHALL HAVE A TRAPEZOIDAL SHAPE AND THE BOTTOM WIDTH SHALL BE EQUAL TO OR GREATER THAN THE NATURAL CHANNEL BOTTOM WIDTH.

(E) TO DETERMINE RIPRAP CLASS AND DEPTH USE STANDARD DRAWING EC-STR-31A.

(F) ONLY GEOTEXTILE FABRIC (TYPE III) LISTED ON THE QUALIFIED PRODUCTS LIST SHALL BE USED.

(G) GEOTEXTILE (TYPE I(I)) (EROSION CONTROL) SHALL BE USED EITHER WITH OR WITHOUT RIPRAP, AS RECOMMENDED IN NOTE BG ON STANDARD DRAWING EC-STR-31A.

(H) GEOTEXTILE FABRIC (TYPE III) SHALL BE USED ALONE ONLY IN CHANNELS WITH INTERMITTENT FLOW. USE A RIPRAP LINED CHANNEL OR CULVERT WHERE THE STREAM FLOWS YEAR-ROUND.

(I) WHERE EXCAVATION FOR A DIVERSION CHANNEL EXPOSES BEDROCK, GEOTEXTILE FABRIC AND RIPRAP SHALL BE REQUIRED ONLY ON THE SIDES OF THE CHANNEL.

(J) RIPRAP TRANSITIONS AT THE ENTRANCE AND EXIT OF THE DIVERSION CHANNEL SHALL BE DESIGNED IN ACCORDANCE WITH APPROVED TDOT METHODS.

(K) DURING CONSTRUCTION OF THE DIVERSION CHANNEL, DAMAGE TO THE EXISTING STREAM AND DAMAGE TO THE CANOPY SHALL BE MINIMIZED. ALL EXISTING VEGETATION OUTSIDE THE CUT AND FILL LINES BUT INSIDE THE RIGHT-OF-WAY SHALL NOT BE DISTURBED UNLESS IT INTERFERES WITH SAFETY STANDARDS.

(L) THE PROJECT SHALL BE PLANNED IN ORDER TO MINIMIZE THE LENGTH OF TIME THE DIVERSION WILL BE REQUIRED.

(M) DIVERSION CHANNEL CONSTRUCTION SHALL BE COMPLETED IN THE DRY BEFORE DIVERTING WATER FROM THE EXISTING CHANNEL. WHERE THIS IS NOT FEASIBLE, TEMPORARY FLOW DIVERSION STRUCTURES CAN BE USED UNTIL WORK IS COMPLETE. THESE STRUCTURES CAN BE ANY NON-ERODIBLE MATERIAL.

(N) CONSTRUCTION SHALL PROCEED AS FOLLOWS:

1. CONSTRUCT A MEANDERING TEMPORARY CHANNEL ADJACENT TO THE PROPOSED PROJECT. ISOLATE THE TEMPORARY CHANNEL FROM THE EXISTING CHANNEL WITH TEMPORARY PLUGS. TEMPORARY EROSION CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 209 OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.

2. THE DIVERSION CHANNEL SHALL BE STABILIZED AND INSPECTED BY THE PROJECT ENGINEER BEFORE FLOW IS DIVERTED. DIVERT FLOW BY MOVING THE TEMPORARY PLUGS FROM THE TEMPORARY CHANNEL TO THE EXISTING CHANNEL. A COFFER DAM MAY BE USED UPSTREAM TO PREVENT STREAM FLOW DURING THIS OPERATION.

3. CONSTRUCT THE PROJECT IN THE EXISTING STREAM AND PLACE PERMANENT EROSION CONTROL ON THE EXISTING STREAM BANKS.

4. WHERE A TEMPORARY PLUG IS REQUIRED AT THE DOWNSTREAM END OF THE DIVERSION, IT SHOULD BE REMOVED FIRST. THEN REMOVE THE UPPER PLUG IN ORDER TO RELEASE FLOW INTO THE RECONSTRUCTED CHANNEL.

5. REMOVE LINING MATERIALS FROM THE DIVERSION CHANNEL, RESTORE THE AREA TO GRADE, AND STABILIZE EXPOSED SOILS.

(O) ALTERNATIVE DIVERSION METHOD MAY INCLUDE PARALLEL JERSEY BARRIERS LINED WITH POLYETHYLENE SHEETING (6 MIL MINIMUM).

(P) DIVERSION CHANNEL SHALL BE INSPECTED WEEKLY OR AFTER EVERY RAIN EVENT. ANY NEEDED REPAIRS SHALL BE DONE IMMEDIATELY.

(Q) FOR INSTALLATION DETAILS AND ITEM NUMBERS FOR DEWATERING STRUCTURES (EC-STR-1), SEDIMENT FILTER BAGS (EC-STR-2), AND SILT FENCE WITH WIRE BACKING (EC-STR-3C) SEE THEIR RESPECTIVE STANDARD DRAWINGS.

MINOR REVISION — FHWA APPROVAL NOT REQUIRED.

NOT TO SCALE

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
TEMPORARY
DIVERSION
CHANNEL
10-26-92 EC-STR-31

COMMUNITY DEVELOPMENT ENTERPRISES
SITE PLAN
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

NRI000040

REVISIONS

THIS DRAWING SHALL BE CONSIDERED PRELIMINARY IN NATURE AND, IN NO WAY, FINAL OR COMPLETE UNLESS THE SEAL OF THE ENGINEER OR SURVEYOR OF RECORD IS AFFIXED HERETO.

SHEET: SITE DETAILS

NUMBER: C-903

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DRAWN BY: NTG | CHECKED BY: WPS | SCALE:
PROJECT # 201044 | DATE: 01/15/2021

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1104 WHITEHALL STREET
JACKSON, TN 38301
PHONE: 731-240-5001
CONTACT: DENNIS EMBERLING

BUILDING & CODES:

CITY OF JACKSON
BUILDING & CODES DEPARTMENT
119 EAST MAIN STREET, SUITE 208
JACKSON, TN 38301
PHONE: 731-425-8255
CONTACT: GREG ROWLAND

CIVIL ENGINEER:

L.I. SMITH AND ASSOCIATES
302 N. CALDWELL STREET
PARIS, TN 38242
PHONE: 731-644-1014
CONTACT: PATRICK SMITH

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CITY OF JACKSON FIRE DEPARTMENT
720 SOUTH HIGHLAND AVENUE
JACKSON, TN 38301
PHONE: 731-425-8350
CONTACT: CHIEF DARRYL SAMUELS

LAND SURVEYOR:

L.I. SMITH AND ASSOCIATES
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PARIS, TN 38242
PHONE: 731-644-1014
CONTACT: PATRICK SMITH

SANITARY SEWER DEPT.

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TELEPHONE:

AT&T
208 SOUTH AKARD STREET
DALLAS, TX 75202
PHONE: 800-288-2020

WATER DEPT.

JACKSON ENERGY AUTHORITY
351 MARTIN LUTHER KING JR. DRIVE
JACKSON, TN 38301
PHONE: 731-422-7371

ELECTRIC:

JACKSON ENERGY AUTHORITY
351 MARTIN LUTHER KING JR. DRIVE
JACKSON, TN 38301
PHONE: 731-422-7371

NATURAL GAS:

JACKSON ENERGY AUTHORITY
351 MARTIN LUTHER KING JR. DRIVE
JACKSON, TN 38301
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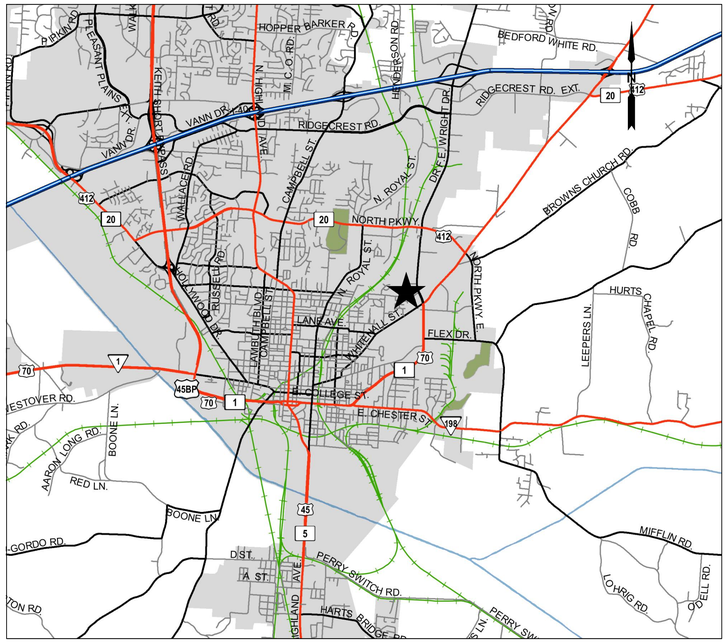
COMMUNITY DEVELOPMENT ENTERPRISES

SITE PLAN

ROOSEVELT PARKWAY

JACKSON, MADISON COUNTY, TENNESSEE



VICINITY MAP - NOT TO SCALE

SITE DATA

A. OWNERS OF RECORD: HUNT PROPERTIES, 1031 GREYSTONE SQUARE, JACKSON, TN 38305; MORRIS CROCKER, 15 SUTTON PLACE, JACKSON, TN 38305

DEVELOPER: COMMUNITY DEVELOPMENT ENTERPRISES, 1104 WHITEHALL STREET, JACKSON, TN 38301

B. SOURCE OF TITLE: BOOK 733, PAGE 731 AND BOOK 257, PAGE 455
TAX MAP 65, PARCEL 103.00 AND 104.00

CITY OF JACKSON, MADISON COUNTY, TENNESSEE

SITE AREA = +/- 32 ACRES
TOTAL AREA = +/- 34.27 ACRES

C. THE SITE IS LOCATED IN UNSHADED FLOOD ZONE "X", AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS DETERMINED BY THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP NO. 471130168E, DATED AUGUST 03, 2009.

PLANNING INFORMATION

A.	ZONING DESIGNATION:	GENERAL RESIDENTIAL DISTRICT
	FRONT SETBACK:	25 FEET
	SIDE SETBACK:	8 FEET
	REAR SETBACK:	10 FEET
B.	INTENDEND USE:	SOLAR MICROGRID
C.	PARKING:	NONE REQUIRED FOR INTENDED USE
	REQUIRED	0 SPACES
	PROPOSED	0 SPACES

SHEET NO.	SHEET NAME	SCALE
C-000	COVER SHEET	
C-100	EXISTING	1"=100'
C-101	VEGATATIVE IMPACT EVAL.	1"=100'
C-200	LAYOUT	1"=100'
C-300	GRADING	1"=100'
C-400	E.P.S.C. PHASE 1	1"=100'
C-401	E.P.S.C. PHASE 2	1"=100'
C-402	E.P.S.C. PHASE 3	1"=100'
C-403	E.P.S.C. PHASE 4	1"=100'
C-900	DETAILS	
C-901	DETAILS	
C-902	DETAILS	
C-903	DETAILS	
C-904	DETAILS	

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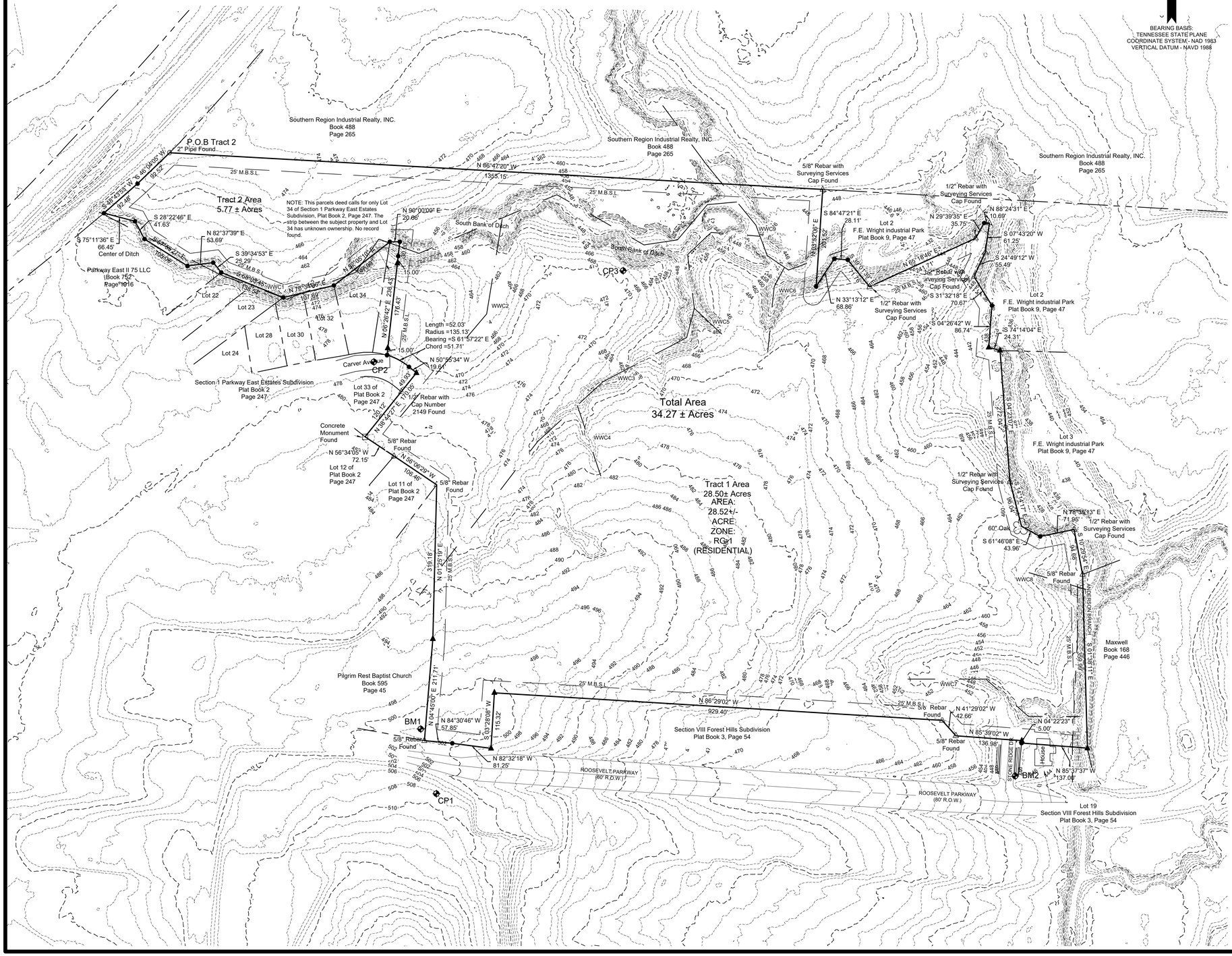
SHEET:	NUMBER:
COVER	C-000

REVISIONS

NRI000041

COMMUNITY DEVELOPMENT ENTERPRISES
SITE PLAN
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE



LEGEND

PROPERTY LINE		GUY WIRE	
PROPERTY ADJOINER LINE		LIGHT POLE	
EASEMENT LINE (ESMT)		POWER POLE	
CENTERLINE OF ROAD		ELECTRICTRANSFORMER	TR
WATER LINE	W	WATER METER	W
GAS LINE	G	WATER VALVE	W
OVERHEAD UTILITY LINE	OE	NATURAL GAS METER	G
SEWER LINE	SS	NATURAL GAS VALVE	G
STORM DRAIN LINE	SD	STORM MANHOLE	SD
OVERHEAD COMS LINE		CATCH BASIN	CB
FLOW LINE		CLEANOUT	CO
DRAIN AREA LINE		SIGN	
REBAR FOUND		TELEPHONE PEDESTAL	PED
5/8" REBAR WITH L.I. SMITH CAP SET		FIRE HYDRANT	
UNMARKED POINT		SEWER MANHOLE	S
BENCHMARK		DECIDUOUS TREE	
CONCRETE SURFACE		EVERGREEN TREE	
ASPHALT SURFACE			

SITE DATA

A. OWNERS OF RECORD: HUNT PROPERTIES, 1031 GREYSTONE SQUARE, JACKSON, TN 38305; MORRIS CROCKER, 15 SUTTON PLACE, JACKSON, TN 38305

DEVELOPER: COMMUNITY DEVELOPMENT ENTERPRISES, 1104 WHITEHALL STREET, JACKSON, TN 38301

B. SOURCE OF TITLE: BOOK 733, PAGE 731 AND BOOK 257, PAGE 455
TAX MAP 65, PARCEL 103.00 AND 104.00

CITY OF JACKSON, MADISON COUNTY, TENNESSEE

SITE AREA = +/- 32 ACRES
TOTAL AREA = +/- 34.27 ACRES

C. THE SITE IS LOCATED IN UNSHADED FLOOD ZONE "X", AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS DETERMINED BY THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP NO. 4711301068E, DATED AUGUST 03, 2009.

SURVEYOR NOTES:

INFORMATION REGARDING THE PRESENCE, SIZE AND LOCATION OF UNDERGROUND UTILITIES IS SHOWN HEREON. THIS INFORMATION HAS BEEN SHOWN BASED ON THE LOCATION OF ABOVE GROUND APPURTENANCES, AVAILABLE DESIGN PLANS, AND FLAGS AND PAINT PLACED BY THE UNDERGROUND PROTECTION SERVICE. NO CERTIFICATION IS MADE AS TO THE ACCURACY OF THOROUGHNESS OF THE INFORMATION CONCERNING UNDERGROUND UTILITIES AND STRUCTURES SHOWN HEREON. (TENNESSEE ONE CALL SYSTEM, INC. 1-800-351-1111).

CONTACT PROPER AUTHORITIES BEFORE BUILDING NEAR UTILITY LINES, FOR EASEMENT WIDTH AND RESTRICTIONS. UTILITIES ARE APPROXIMATE AND SHOULD BE VERIFIED PRIOR TO ANY CONSTRUCTION.

THIS SURVEY HAS BEEN PREPARED FOR THE EXCLUSIVE USE OF THE PERSON ENTITIES NAMED HERON. NO EXPRESS OR IMPLIED WARRANTIES WITH RESPECT TO THE INFORMATION SHOWN HEREON IS TO BE EXTENDED TO ANY PERSONS OR ENTITIES OTHER THAN THOSE SHOWN HEREON.

THIS PROPERTY IS SUBJECT TO ALL EASEMENTS, RIGHTS OF WAY, RESTRICTIONS AND CONVEYANCES OF RECORD OR IN EXISTENCE. A TITLE COMMITMENT WAS NOT PROVIDED TO THE SURVEYOR.

THE SURVEY SHOWN HEREON WAS MADE IN ACCORDANCE WITH CHAPTER 0820-3, STANDARDS OF PRACTICE AS ADOPTED BY THE TENNESSEE STATE BOARD OF EXAMINERS FOR LAND SURVEYORS.

EXISTING CONDITIONS NOTES:

1. EXISTING SITE IS MOSTLY WOODED AND SLOPES FROM THE SOUTHWEST TO THE NORTHEAST AT A 5-8% SLOPE.
2. (9) EXISTING WET WEATHER CONVEYANCES (WWC) HAVE BEEN IDENTIFIED BY A HYDROLOGIC DETERMINATION PERFORMED BY CHRIS GROW OF GROW ENVIRONMENTAL DATED JANUARY 05, 2021.
3. AN EXISTING STREAM, ANDERSON BRANCH, RUNS ALONG THE PROPERTY LINE AT THE SOUTHEAST CORNER OF THE SITE.
4. AN EXISTING ADJOINER HOUSE, LOT 19 FOREST HILLS SUBDIVISION, APPEARS TO ENCROACH ONTO THE SITE.
5. EXCESS TOPSOIL AND TREE STUMPS WILL BE REMOVED OFFSITE.

CONTROL			
ID	NORTHING	EASTING	ELEVATION	DESCRIPTION
CP1	485434.437	1138186.576	507.00	NAIL SET
CP2	486328.707	1138057.117	477.46	NAIL SET
CP3	486517.922	1138573.650	468.05	NAIL SET
BM1	485568.348	1138154.225	502.26	REBAR SET
BM2	485474.214	1139385.985	445.28	REBAR SET
COORDINATE SYSTEM - NAD 1983			
VERTICAL DATUM - NAVD 1988			

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

REVISIONS

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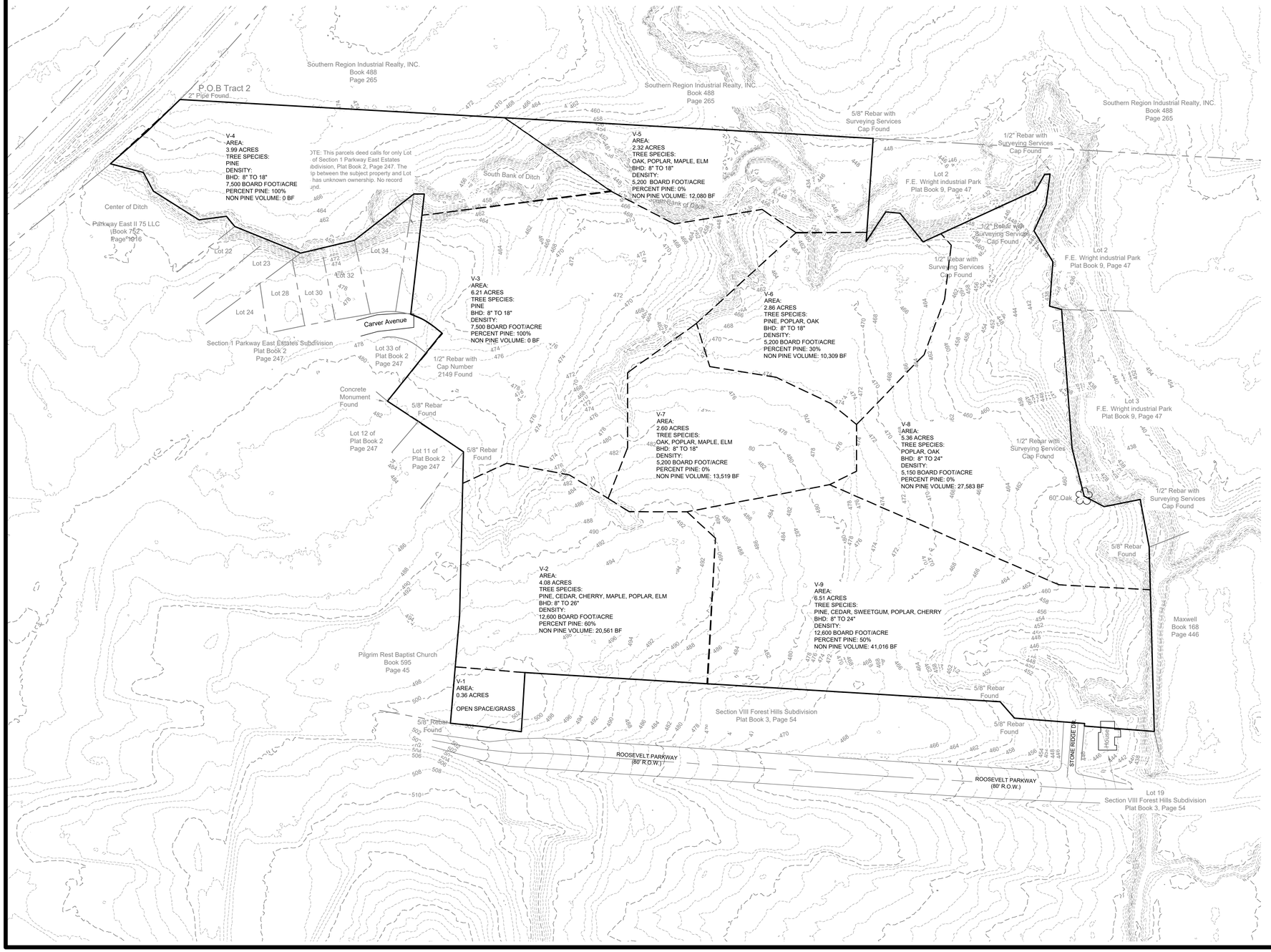
L.I. Smith and Associates, Inc.
LAND DEVELOPMENT | INFRASTRUCTURE DESIGN
SURVEYING SERVICES
302 North Caldwell Street, Paris, TN 38242 / 731-644-1014 \ www.lismith.com
475 Metroplex Drive, Suite 212 Nashville, TN 37211 \ 615-256-0290

DRAWN BY: NTG | CHECKED BY: WPS | SCALE: 1"=100'
PROJECT # 201044 | DATE: 01/15/2021

SHEET: EXISTING | NUMBER: C-100

COMMUNITY DEVELOPMENT ENTERPRISES
SITE PLAN
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE



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A. OWNERS OF RECORD: HUNT PROPERTIES, 1031 GREYSTONE SQUARE, JACKSON, TN 38305; MORRIS CROCKER, 15 SUTTON PLACE, JACKSON, TN 38305

DEVELOPER: COMMUNITY DEVELOPMENT ENTERPRISES, 1104 WHITEHALL STREET, JACKSON, TN 38301

B. SOURCE OF TITLE: BOOK 733, PAGE 731 AND BOOK 257, PAGE 455
TAX MAP 65, PARCEL 103.00 AND 104.00

CITY OF JACKSON, MADISON COUNTY, TENNESSEE

SITE AREA = +/- 34.27 ACRES
TOTAL AREA = +/- 34.27 ACRES

C. THE PROPERTY DESCRIBED HEREON IS LOCATED IN UNSHADED FLOOD ZONE "X", AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS DETERMINED BY THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP NO. 47130168E, DATED AUGUST 03, 2009.

AREA ID	AREA (AC)	DENSITY (BF/AC)	VOLUME (BF)	% Pine	non-pine VOLUME (BF)
V-1	0.36				
V-2	4.08	12600	51,402.56	60%	20,561
V-3	6.21	7500	46,572.31	100%	0
V-4	3.99	7500	29,961.60	100%	0
V-5	2.32	5200	12,080.81	0%	12,081
V-6	2.86	5150	14,726.68	30%	10,309
V-7	2.60	5200	13,519.16	0%	13,519
V-8	5.36	5150	27,583.48	0%	27,583
V-9	6.51	12600	82,031.90	50%	41,016
			TOTAL		125,069

Hunt-Jackson Site

Existing Conditions of the 34-acre site:

1. Existing soils - This site had three major soils types, Collins silt, Feliciana silt, and Lexington silt loam.

a. Collins silt series consists of very deep, moderately well drained, moderately permeable soils. They formed in silty alluvium on flood plains of streams in the Southern Mississippi Valley Silty Uplands Major Land Resources Area. Slopes range from 0 - 2 percent.

b. Feliciana silt loam consists of very deep, well drained, moderately permeable soil in the Southern Mississippi Valley Loess Major Land Resources Area (MLRA 134). They formed in Peoria loess deposits more than 48 inches in thickness that overly terraces and uplands of the Southern Coastal Plain. Slopes range from 0 to 40 percent.

c. Lexington silt loam consists of very deep, well drained soils on level to moderately steep uplands. The soil formed in a mantle of loess about 2 to 3 feet thick and in the underlying loamy and sandy marine sediments. Slopes ranges from 0 to 30 percent.

2. Existing vegetation:

a. Existing trees are not ancient in nature. Most of the tract of land has been farming and the whole tract has been timbered in the last 50 years. A very few trees with canopy still exist on this tract of land. The existing vegetation is recent growth since the land has been cleared and farmed. A 1940s aerial photo shows the majority of the tract in cultivation.

b. Ground cover that has taken over in the open area recently is the invasive weed, kudzu. The rest of the area is native ground cover of briars, ivy and other natural to the area.

3. Type and board feet of Trees:

a. The accompanying map shows an estimate of board feet of timber for different areas of the site. It also shows the different common species that are the most prevalent in each area.

b. This Site does not show any evidence of past logging. New growth has been established through natural reseeding.

A. Site Utilization:

1. This Site is considered to be a full use industrial site. The intended use for this site is to be full utilization of the entire property. The site will be graded to a gentle rolling grade with slopes that do not entice erosion.

2. The project Site will be covered with stone or rock over a membrane to allow for infiltration. No vegetative or tree planting will be undertaken on the site to establish new growth.

B. Vegetative Impact:

1. Due to the use and the fixtures on the site, vegetation and weedy plants would be a hindrance to the utilization.

a. All existing vegetation and tree will be removed from this site.

b. The estimated amount of harvestable timber is 1607 trees. It appears to be simple to determine an impact by the number of trees, rather than the BF of marketable lumber.

c. Since the track has no room for planting replacement trees, other conservation area needs to be secured in the Jackson City Area.

GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

REVISIONS

L.I. Smith and Associates, Inc.
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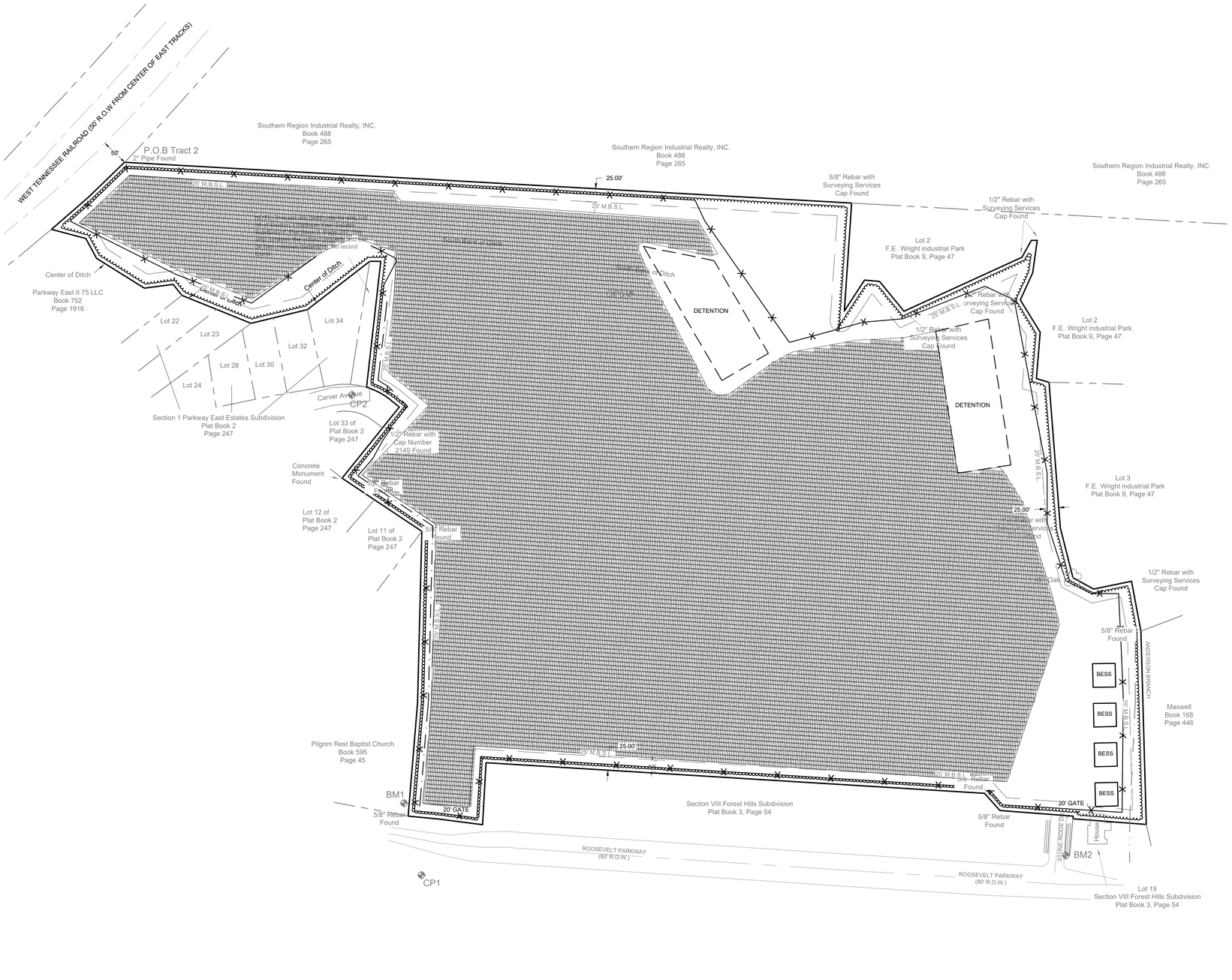
DRAWN BY: NTG | CHECKED BY: WPS | SCALE: 1"=100'
PROJECT # 201044 | DATE: 01/15/2021

SHEET: EXISTING TREE COVER | NUMBER: C-101

NRI000043



LEGEND

N

BEARING BASIS:
TENNESSEE STATE PLANE
COORDINATE SYSTEM - NAD 1983
VERTICAL DATUM - NAVD 1988

- PROPERTY LINE
- PROPERTY ADJOINER LINE
- EASEMENT LINE (ESMT)
- CENTERLINE OF ROAD
- WATER LINE
- GAS LINE
- OVERHEAD UTILITY LINE
- SEWER LINE
- STORM DRAIN LINE
- OVERHEAD COMS LINE
- FLOW LINE
- DRAIN AREA LINE
- REBAR FOUND
- 5/8" REBAR WITH L.I. SMITH CAP SET
- UNMARKED POINT
- BENCHMARK
- CONCRETE SURFACE
- ASPHALT SURFACE
- GUY WIRE
- LIGHT POLE
- POWER POLE
- ELECTRICTRANSFORMER
- WATER METER
- WATER VALVE
- NATURAL GAS METER
- NATURAL GAS VALVE
- STORM MANHOLE
- CATCH BASIN
- CLEANOUT
- SIGN
- TELEPHONE PEDESTAL
- FIRE HYDRANT
- SEWER MANHOLE
- DECIDUOUS TREE
- EVERGREEN TREE

SITE SPECIFIC LAYOUT NOTES:

1. A 10' WIDE LANDSCAPING BUFFER WILL BE MAINTAINED AROUND THE PERIMETER OF THE SITE.
2. 6,300 LINEAR FEET OF PERIMETER FENCING WILL BE INSTALLED. (2) 20' GATES WILL BE INSTALLED FOR ACCESS.
3. APPROXIMATELY 43,900 SOLAR PANELS (40" x 78.7") WILL BE INSTALLED.
4. (4) 44'x42' BATTERY ENERGY STORAGE COMPOUNDS (BESS) WILL BE CONSTRUCTED AT THE SOUTHEAST CORNER OF THE SITE TO BE ACCESSED BY STONE RIDGE DRIVE.
5. A DIVERSION CHANNEL WILL BE INSTALLED ALONG THE WESTERN PROPERTY LINE TO DIVERT OFFSITE WATER AROUND T THE SITE.
6. (2) DETENTION PONDS WILL BE CONSTRUCTED AT THE REAR OF THE SITE.

FLOODPLAIN NOTE:

THE SITE IS LOCATED IN UNSHADED FLOOD ZONE "X", AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS DETERMINED BY THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP NO. 471130168E, DATED AUGUST 03, 2009.

CONTROL				
ID	NORTHING	EASTING	ELEVATION	DESCRIPTION
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CP2	486328.707	1138057.117	477.46	NAIL SET
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COORDINATE SYSTEM - NAD 1983				
VERTICAL DATUM - NAVD 1988				

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

COMMUNITY DEVELOPMENT ENTERPRISES
SITE PLAN
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

REVISIONS

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SHEET: LAYOUT

NUMBER: C-200

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DRAWN BY: NTG | CHECKED BY: WPS | SCALE: 1"=100'
PROJECT # 201044 | DATE: 01/15/2021

NRI000044

PROPOSED PIPE TABLE												
FROM		TO		PIPE								
STRUCTURE	INV. ELEVATION	STRUCTURE	INV. ELEVATION	MATERIAL	DIAMETER	LENGTH	SLOPE	DRAIN AREA (AC)	FULL PIPE VELOCITY (FPS)	PIPE FLOW CAPACITY (CFS)	10 YR DESIGN FLOW (CFS)	
1	448.00	2	446.32	RCP	24"	84	2.00%	12.49	8.83	27.73	19.05	
2	435.78	3	435.00	RCP	24"	39	2.00%	12.49	8.83	27.73	19.05	
4	449.00	5	448.00	RCP	24"	50	2.00%	13.65	8.83	27.73	18.93	
5	442.58	6	442.00	RCP	24"	29	2.00%	13.65	8.83	27.73	18.93	
7	441.50	8	441.00	RCP	36"	54	0.93%	9.73	8.18	57.81	38.43	

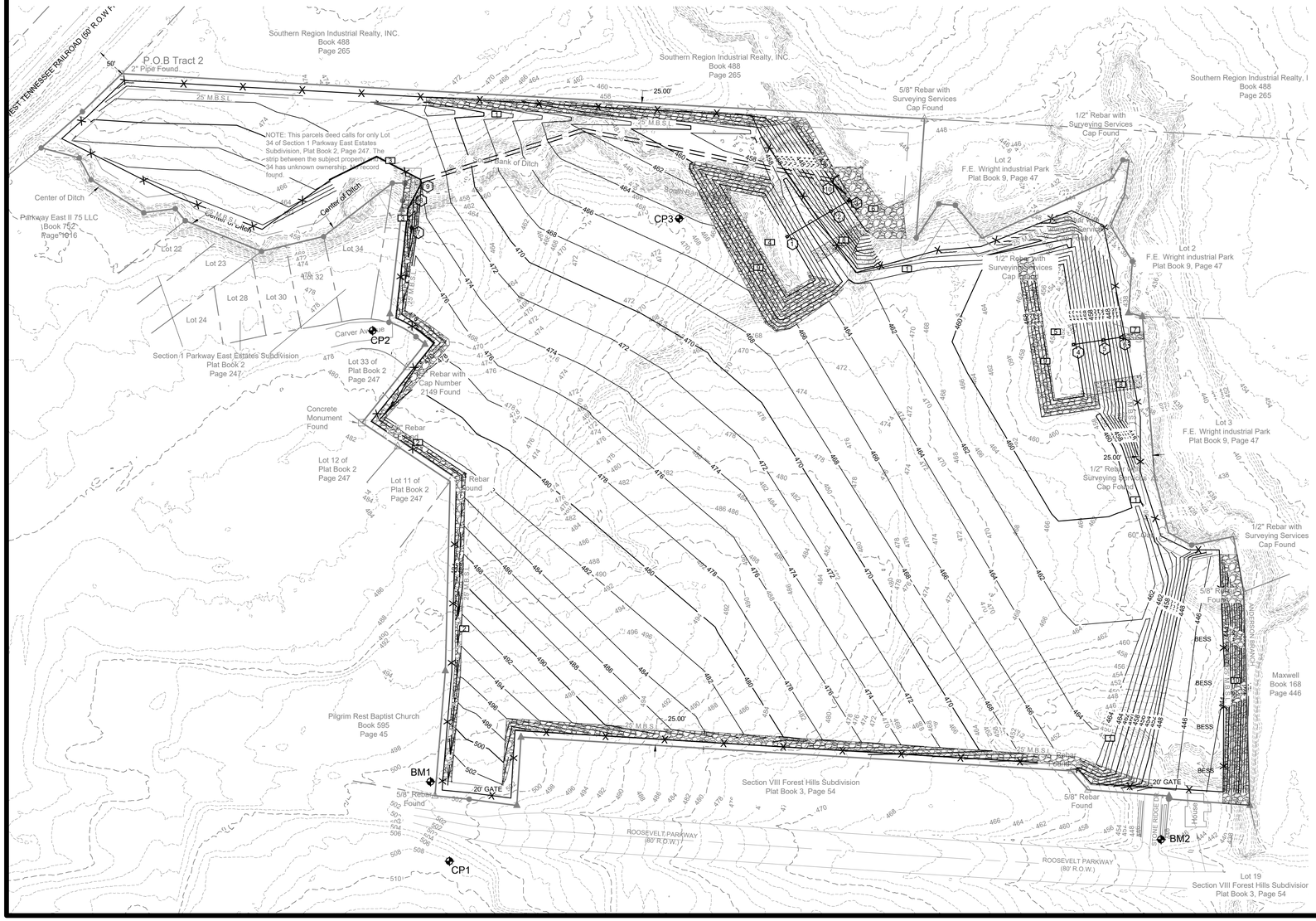
PROPOSED BOX CULVERT												
FROM		TO		SINGLE BARREL CULVERT								
STRUCTURE	INV. ELEVATION	STRUCTURE	INV. ELEVATION	SPAN HEIGHT	SPAN WIDTH	LENGTH	SLOPE	DRAIN AREA (AC)	MAX COVER (FT)	FULL PIPE VELOCITY	PIPE FLOW CAPACITY	10 YR DESIGN FLOW (CFS)	100 YR DESIGN
9	440.50	10	433.50	72"	96"	720	0.97%	84.20	25.00	13.00	520	326.31	463

PROPOSED STRUCTURE TABLE							
STRUCTURE	TYPE	RIM	INV. IN	INV. OUT	DEPTH	AREA (AC)	10YR (CFS)
1	Detention outlet	454.00	448.00	448.00	6.00	12.49	19.05
2	CB No. 42	451.00	446.32	435.78	15.22	12.49	19.05
3	Headwall	437.75		435.00	2.75	12.49	19.05
4	Detention outlet	455.00	449.00	449.00	6.00	13.65	18.93
5	CB No. 42	454.00	448.00	442.58	11.42	13.65	18.93
6	Headwall	444.75		442.00	2.75	13.65	18.93
7	CB No. 42	467.5		441.50	26.00	0.06	0.46
8	charge to WingWall			441.00		0.13	0.67
9	WING WALL 45°		440.50				
10	WING WALL 45°			433.50			

GRADING LEGEND:

1. 2' TALL CONTAINMENT BERM
2. DIVERSION CHANNEL/BERM
3. MSE RETAINING WALL
4. DETENTION POND 1
5. DETENTION POND 2
6. RIP RAP CHANNEL LINING
7. 10'x35' CLASS A-1 RIP RAP 2' MIN.
8. 20' WIDE CONCRETE SPILLWAY
9. SLOPE STABILIZATION CLASS A-1 RIP RAP 2' MIN.
10. ANDERSON BRANCH SLOPE STABILIZATION CLASS A-1 RIP RAP 2' MIN.

(X) STORMWATER STRUCTURE



SITE GRADING NOTES:

1. AN EXISTING WET WEATHER CONVEYANCE (WWC1) WILL BE REPLACED WITH 720' OF 6'x8' REINFORCED CONCRETE BOX CULVERT.
2. EXISTING WWC WILL BE FILLED IN. EXISTING CHANNEL WALLS WILL BE BENCHED BACK AT EACH 6" LIFT TO ENSURE PROPER COMPACTION AND COHESION TO EXISTING SOILS.
3. ALL FILL MATERIAL SHALL BE PLACED IN 6" LIFTS AND COMPACTED TO A 95% STANDARD PROCTOR. (ASTM D698)
4. SITE GRADES WILL SLOPE GENERALLY TOWARDS THE NORTH EAST AT 3-5% SLOPES.
5. A DIVERSION CHANNEL/BERM WILL BE CONSTRUCTED ALONG THE WEST SIDE OF THE SITE. THIS DIVERSION CHANNEL WILL DIRECT OFFSITE WATER AROUND THE SITE TO A DROP INLET THAT WILL DISCHARGE INTO THE WINGWALL OF THE NEW BOX CULVERT. DIVERSION CHANNEL WILL BE STABILIZED WITH CLASS A-1 RIP RAP AT A MIN. DEPTH OF 2 OVER GEOTEXTILE FABRIC'.
6. A 2' TALL CONTAINMENT BERM WILL BE CONSTRUCTED ALONG THE LOWER END OF THE SITE. CONTAINMENT BERM WILL DIVERT STORMWATER RUNOFF FROM THE SITE INTO ONE OF TWO DETENTION PONDS.
7. FILL SLOPES ALONG THE NORTH PROPERTY LINE WILL BE STABILIZED WITH CLASS A-1 RIP RAP AT A MIN DEPTH OF 2' OVER GEOTEXTILE FABRIC.
8. FORE SLOPES OF BOTH DETENTION PONDS WILL BE STABILIZED WITH CLASS A-1 RIP RAP AT A MIN DEPTH OF 2' OVER GEOTEXTILE FABRIC.
9. EXISTING CHANNEL WILL BE LINED FOR 135 BELOW THE OUTLET HEADWALL OF THE NEW BOX CULVERT WITH CLASS A-1 RIP RAP AT A MIN DEPTH OF 3' OVER GEOTEXTILE FABRIC.

POND NOTE:
CONTRACTOR TO ENSURE POST CONSTRUCTION SEDIMENT REMOVAL TO ENSURE FINAL POND ELEVATIONS ARE MAINTAINED AND FUNCTION AS INTENDED.

CONTROL				
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VERTICAL DATUM - NAVD 1988				

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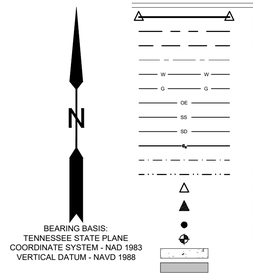

LEGEND

PROPERTY LINE	GUY WIRE
PROPERTY ADJOINER LINE	LIGHT POLE
EASEMENT LINE (ESMT)	POWER POLE
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CONCRETE SURFACE	EVERGREEN TREE
ASPHALT SURFACE	

COMMUNITY DEVELOPMENT ENTERPRISES
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DRAWN BY: NTG	CHECKED BY: WPS	SCALE: 1"=100'	
PROJECT # 201044		DATE: 01/15/2021	

SHEET: GRADING NUMBER: C-300

NRI000045

COMMUNITY DEVELOPMENT ENTERPRISES
SITE PLAN
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

OUTFALL #	LATITUDE (N)	LONGITUDE (W)	APPROX. ELEV. (FEET)	PRE AREA (ACRES)	POST AREA (ACRES)	RECIEVING WATERS
OUTFALL 1	35.637373	88.796385	463	0.98	0.98	ANDERSON BRANCH
OUTFALL 2	35.637331	88.795473	461	1.14	1.14	ANDERSON BRANCH
OUTFALL 3	35.633755	88.794744	457	0.64	0.47	ANDERSON BRANCH
OUTFALL 4	35.637763	88.794225	455	0.67	0.00	ANDERSON BRANCH
OUTFALL 5	35.637675	88.792950	436	0.91	1.26	ANDERSON BRANCH
OUTFALL 6	35.637470	88.794722	445	0.40	9.34	ANDERSON BRANCH
OUTFALL 7	35.637471	88.794206	450	9.73	0.00	ANDERSON BRANCH
OUTFALL 8	35.637401	88.792955	440	10.12	12.49	ANDERSON BRANCH
OUTFALL 9	35.637285	88.792312	442	0.83	0.00	ANDERSON BRANCH
OUTFALL 10	35.636967	88.790871	442	6.07	13.65	ANDERSON BRANCH
OUTFALL 11	35.635639	88.790160	430	2.06	0.43	ANDERSON BRANCH
OUTFALL 12	35.634869	88.790127	427	7.13	2.89	ANDERSON BRANCH

EROSION CONTROL LEGEND

- LIMITS OF CONSTRUCTION
- WBSF — WBSF — WIRE BACKED SILT FENCE
- CHECK DAM
- INLET PROTECTION
- LANDSCAPING/SUITABLE COVER

LEGEND

- PROPERTY LINE
- PROPERTY ADJOINER LINE
- EASEMENT LINE (ESMT)
- CENTERLINE OF ROAD
- WATER LINE
- GAS LINE
- OVERHEAD UTILITY LINE
- SEWER LINE
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- UNMARKED POINT
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- STORM MANHOLE
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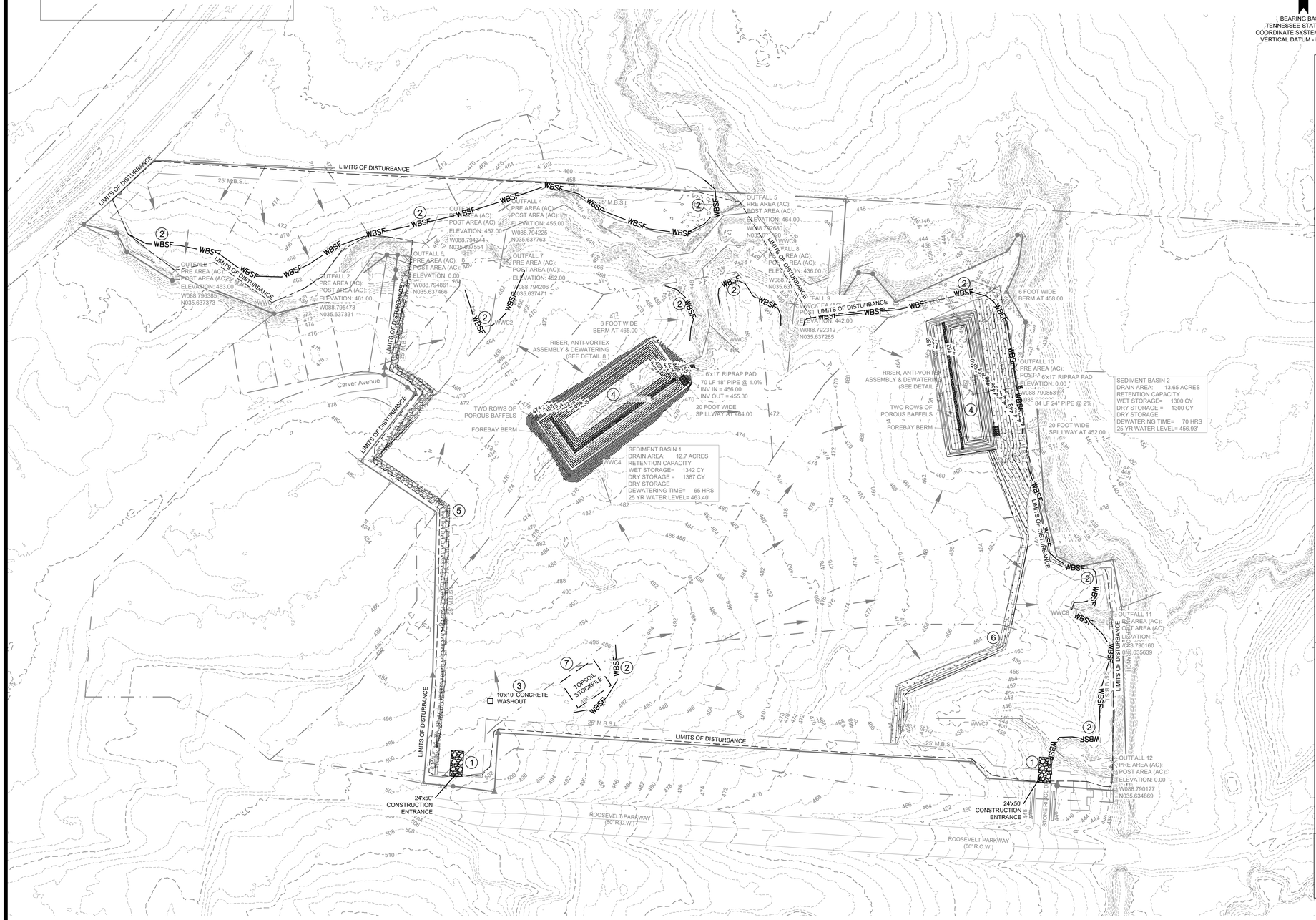
- SIGN
- TELEPHONE PEDESTAL
- FIRE HYDRANT
- SEWER MANHOLE
- DECIDUOUS TREE
- EVERGREEN TREE

N

BEARING BASIS:
TENNESSEE STATE PLANE
COORDINATE SYSTEM - NAD 1983
VERTICAL DATUM - NAVD 1988



EROSION CONTROL NOTES:

1. NO TREES ARE TO BE REMOVED AND/OR VEGETATION DISTURBED EXCEPT AS NECESSARY FOR GRADING PURPOSES AND ONLY AS APPROVED BY OWNER'S REPRESENTATIVE AND TOWN ENGINEER.
2. TOPSOIL IS TO BE STRIPPED FROM ALL CUT AND FILL AREAS, STOCKPILED AND REDISTRIBUTED OVER GRADED AREAS TO A MINIMUM OF 6".
3. ALL GRADED AREAS, INCLUDING SLOPES, ARE TO BE STABILIZED AS SOON AS POSSIBLE AFTER GRADING IS COMPLETED, BUT NO LONGER THAN 14 DAYS LATER.
4. CONSTRUCT EROSION CONTROL AS SHOWN ON DRAWINGS PRIOR TO BEGINNING GRADING OPERATIONS.
5. ALL NEW STRUCTURES AND EXISTING STRUCTURES SHALL HAVE SEDIMENT REMOVED PRIOR TO ACCEPTANCE.
6. SILT BARRIERS SHALL BE CLEANED OF ACCUMULATED SEDIMENT WHEN APPROXIMATELY 33% FILLED WITH SUCH SEDIMENT.
7. ALL DIMENSIONS AND LOCATIONS OF TEMPORARY EROSION AND WATER POLLUTION CONTROL DEVICES SHALL BE SUBJECT TO ADJUSTMENT AS DESIGNATED BY THE OWNER'S REPRESENTATIVE AND TOWN ENGINEER.
8. WHEN THE TEMPORARY SOIL EROSION AND WATER POLLUTION DEVICES ARE NO LONGER REQUIRED FOR THE INTENDED PURPOSE IN THE OPINION OF THE OWNER'S REPRESENTATIVE AND TOWN ENGINEER, THEY SHALL BE REMOVED.
9. REPLACE SILT BARRIERS WHEN CONDITIONS WARRANT AND AS DIRECTED BY THE OWNER'S REPRESENTATIVE AND TOWN ENGINEER.
10. ALL SLOPES 3:1 OR STEEPER SHALL BE STABILIZED WITH EROSION CONTROL MATTING INSTALLED PER MANUFACTURERS' RECOMMENDATIONS, OR SOD.
11. ANY MUD/CONSTRUCTION DEBRIS THAT MAY BE TRANSPORTED TO SURROUNDING ROADS, OR OTHER SURROUNDING ROADS OR PARKING AREAS SHALL BE CLEANED UP IMMEDIATELY.
12. GENERAL CONTRACTOR SHALL KEEP GROUND DISTURBANCE TO THE MINIMUM REQUIRED TO COMPLETE THE PROJECT. ALL AREAS MUST BE TEMPORARILY OR PERMANENTLY STABILIZED IF DISTURBED AREA HAS NOT BEEN WORKED WITHIN THE PAST 14 DAYS.
13. SOD SHALL BE TURF TYPE TALL FESCUE.
14. TIME OF EXPOSURE OF UNPROTECTED SOILS SHALL BE KEPT TO A MAXIMUM PERIOD OF 7 DAYS. TEMPORARY STABILIZATION MEASURES, I.E. SEEDING & MULCHING, SHALL BE PERFORMED ON ANY UNPROTECTED AREA WHERE CONSTRUCTION OPERATIONS WILL CEASE FOR 7 OR MORE DAYS.
15. KEEP DUST WITHIN TOLERABLE LIMITS BY SPRINKLING OR OTHER ACCEPTABLE MEANS.
16. CONSTRUCTION ENTRANCE SHALL BE IN PLACE PRIOR TO ANY COMBUSTIBLES, I.E. CONSTRUCTION TRAILER, LUMBER, ETC. BEING PRESENT ON JOB SITE. IN ADDITION TO THE CONSTRUCTION ENTRANCE, AN ALL WEATHER DRIVE MUST BE IN PLACE AND ACCESSIBLE TO ALL AREAS OF THE CONSTRUCTION SITE THAT WILL CONTAIN COMBUSTIBLES THROUGHOUT ALL PHASES OF THE CONSTRUCTION PROCESS. THE ALL WEATHER DRIVE SHALL BE NO LESS THAN 20 FEET OF UNOBSTRUCTED WIDTH WITH ADEQUATE TURNING RADIUS CAPABLE OF SUPPORTING THE IMPOSED LOADS OF THE FIRE DEPARTMENT APPARATUS.
17. USE TEMPORARY VEGETATION AND/OR MULCH TO PROTECT BARE AREAS FROM EROSION DURING CONSTRUCTION.
18. NO OTHER WORK WILL BE INITIATED ON THE PROJECT UNTIL THE EROSION/SILTATION MEASURES SHOWN ON THE PLANS AND DETAILS ARE PROPERLY IN PLACE.
19. IF, AT ANY TIME DURING THE CONSTRUCTION PHASE OF THIS PROJECT, THE EROSION/SILTATION MEASURES INSTALLED FAIL TO FUNCTION PROPERLY, NEED MAINTENANCE OR REPAIR, OR NEED NEW REPLACEMENT IN ANY KIND, THE CONTRACTOR WILL EFFECT SUCH ACTIONS AS ARE NEEDED TO CORRECT THE SITUATION AT NO ADDITIONAL COST TO THE OWNER.
20. DISTURBED AREAS ARE TO BE GRADED TO DRAIN AS INDICATED ON PLAN TO SEDIMENT BARRIERS DURING AND UPON COMPLETION OF CONSTRUCTION.
21. ALL CUT/FILL AREAS TO BE LANDSCAPED OR THAT HAVE A VEGETATIVE COVER POST-CONSTRUCTION, SHALL HAVE A MINIMUM OF 6-INCH DEPTH TOPSOIL COVER. AREAS DRESSED WITH TOPSOIL SHALL BE SODDED AS SHOWN ON SHEET L1, LANDSCAPING PLAN.
22. UPON STABILIZATION OF THE PROJECT SITE WITH A GOOD (ACCEPTABLE) STAND OF GRASS AND/OR GROUND COVER, THE EROSION/SILTATION INSTALLATIONS WILL BE REMOVED AND THE AREA DISTURBED WILL BE SODDED AS OTHER NEW GRASSED AREAS OF THE PROJECT.

SITE SPECIFIC EROSION CONTROL NOTES:

1. CONTRACTOR TO INSTALL AND MAINTAIN VEHICLE TRACKING CONTROL (CONSTRUCTION ENTRANCE/EXIT) (REF C-900).
2. CONTRACTOR TO INSTALL AND MAINTAIN WIRE BACKED SILT FENCE PERIMETER (REF. C-900).
3. CONTRACTOR TO INSTALL AND MAINTAIN 10' X 10' CONCRETE WASHOUT PIT WITH DIRECTIONAL SIGNS (REF. C-900).
4. CONSTRUCT A SEDIMENT BASIN WITH ASSOCIATED RISER, DISCHARGE, FOREBAY, AND POROUS BAFFELS. (REF. C-900).
5. CONSTRUCT A DIVERSION DITCH TO ROUTE 9.33 ACRES OF OFFSITE DRAINAGE AROUND THE SITE AT OUTFALL 6 (REF. C-900) TO KEEP DRAINAGE AREA TO OUTFALL 7 UNDER 5 ACRES..
6. CONSTRUCT A DIVERSION BERM TO ROUTE 5.5 ACRES OF DRAINAGE TO SEDIMENT BASIN 2 TO KEEP THE DRAINAGE AREA TO OUTFALL 12 UNDER 5 ACRES (REF. C-900).
7. STOCKPILE TOPSOIL AT DESIGNATED AREA.

FLOODPLAIN NOTE:

THE SITE IS LOCATED IN UNSHADED FLOOD ZONE "X", AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS DETERMINED BY THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP NO. 47113O168E, DATED AUGUST 03, 2009.

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

REVISIONS

THIS DRAWING SHALL BE CONSIDERED PRELIMINARY IN NATURE AND, IN NO WAY, FINAL OR COMPLETE, UNLESS THE SEAL OF THE ENGINEER OR SURVEYOR OF RECORD IS AFFIXED HERETO.

SHEET: E.P.S.C PHASE 1 | NUMBER: C-400

L.I. Smith and Associates, Inc.
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SURVEYING SERVICES
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475 Metroplex Drive, Suite 212 Nashville, TN 37211 | 615-256-0290

DRAWN BY: NTG | CHECKED BY: WPS | SCALE: 1"=100' | DATE: 01/15/2021
PROJECT # 201044

NRI000046

COMMUNITY DEVELOPMENT ENTERPRISES
SITE PLAN
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

OUTFALL #	LATITUDE (N)	LONGITUDE (W)	APPROX. ELEV. (FEET)	PRE AREA (ACRES)	POST AREA (ACRES)	RECIEVING WATERS
OUTFALL 1	35.637373	88.796385	463	0.98	0.98	ANDERSON BRANCH
OUTFALL 2	35.637331	88.795473	461	1.14	1.14	ANDERSON BRANCH
OUTFALL 3	35.633755	88.794744	457	0.64	0.47	ANDERSON BRANCH
OUTFALL 4	35.637763	88.794225	455	0.67	0.00	ANDERSON BRANCH
OUTFALL 5	35.637675	88.792950	436	0.91	1.26	ANDERSON BRANCH
OUTFALL 6	35.637470	88.794722	445	0.40	9.34	ANDERSON BRANCH
OUTFALL 7	35.637471	88.794206	450	9.73	0.00	ANDERSON BRANCH
OUTFALL 8	35.637401	88.792955	440	10.12	12.49	ANDERSON BRANCH
OUTFALL 9	35.637285	88.792312	442	0.83	0.00	ANDERSON BRANCH
OUTFALL 10	35.636967	88.790871	442	6.07	13.65	ANDERSON BRANCH
OUTFALL 11	35.635639	88.790160	430	2.06	0.43	ANDERSON BRANCH
OUTFALL 12	35.634869	88.790127	427	7.13	2.89	ANDERSON BRANCH

EROSION CONTROL LEGEND

- LIMITS OF CONSTRUCTION
- WBSF — WBSF — WIRE BACKED SILT FENCE
- CHECK DAM
- INLET PROTECTION
- LANDSCAPING/SUITABLE COVER

LEGEND

- PROPERTY LINE
- PROPERTY ADJOINER LINE
- EASEMENT LINE (ESMT.)
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- WATER LINE
- GAS LINE
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- SEWER LINE
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- OVERHEAD COMS LINE
- FLOW LINE
- DRAIN AREA LINE
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- 5/8" REBAR WITH L.I. SMITH CAP SET
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- BENCHMARK
- CONCRETE SURFACE
- ASPHALT SURFACE
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- POWER POLE
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- NATURAL GAS VALVE
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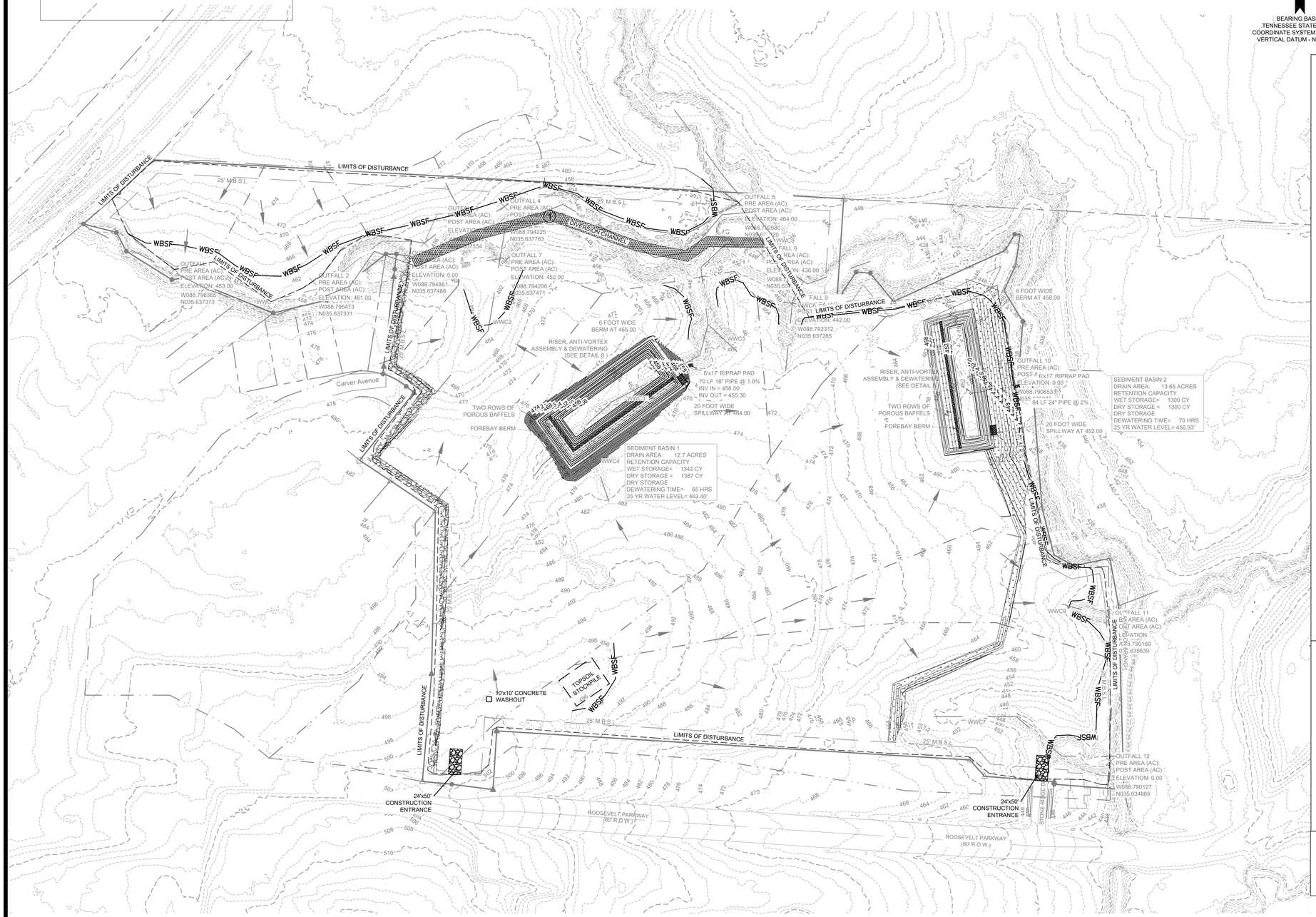
- SIGN
- TELEPHONE PEDESTAL
- FIRE HYDRANT
- SEWER MANHOLE
- DECIDUOUS TREE
- EVERGREEN TREE

N

BEARING BASIS:
TENNESSEE STATE PLANE
COORDINATE SYSTEM - NAD 1983
VERTICAL DATUM - NAVD 1988



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SITE SPECIFIC EROSION CONTROL NOTES:

1. CONSTRUCT DIVERSION CHANNEL IN EXISTING CHANNEL TO ROUTE WATER AROUND THE CONSTRUCTION OF THE BOX CULVERT . DIVERSION DITCH MUST HAVE A MINIMAL CROSS SECTIONAL AREA OF 32 SQUARE FEET(REF. C-903).

FLOODPLAIN NOTE:

THE SITE IS LOCATED IN UNSHADED FLOOD ZONE "X", AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS DETERMINED BY THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP NO. 47113O168E, DATED AUGUST 03, 2009.

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

REVISIONS

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DRAWN BY: NTG	CHECKED BY: WPS	SCALE: 1"=100'
PROJECT # 201044		DATE: 01/15/2021

SHEET: E.P.S.C PHASE 2 NUMBER: C-401

NRI000047

COMMUNITY DEVELOPMENT ENTERPRISES
SITE PLAN
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

OUTFALL #	LATITUDE (N)	LONGITUDE (W)	APPROX. ELEV. (FEET)	PRE AREA (ACRES)	POST AREA (ACRES)	RECIEVING WATERS
OUTFALL 1	35.637373	88.796385	463	0.98	0.98	ANDERSON BRANCH
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EROSION CONTROL LEGEND

- LIMITS OF CONSTRUCTION
- WBSF — WBSF — WIRE BACKED SILT FENCE
- CHECK DAM
- INLET PROTECTION
- LANDSCAPING/SUITABLE COVER

LEGEND

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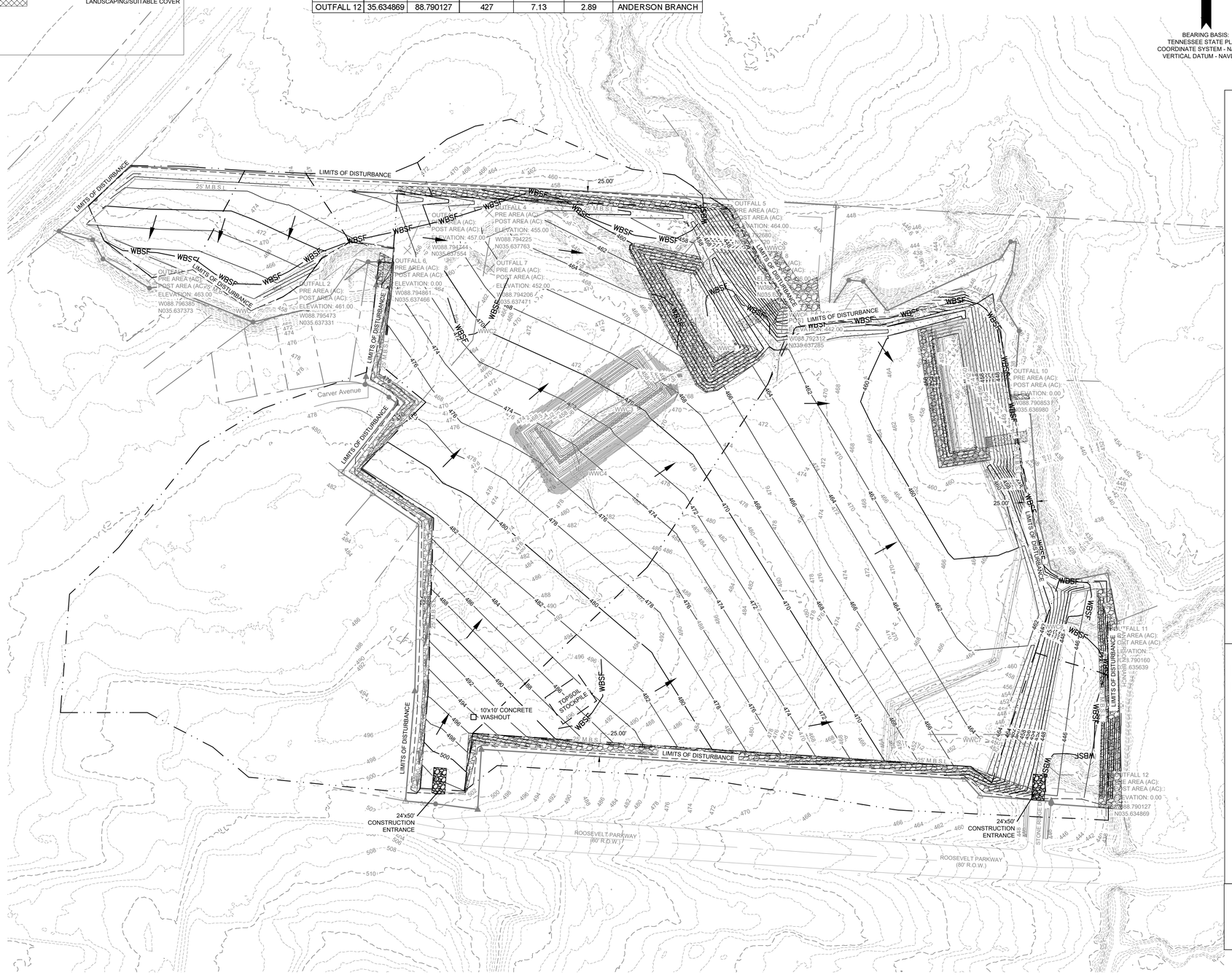
- DECIDUOUS TREE
- EVERGREEN TREE

BEARING BASIS:
TENNESSEE STATE PLANE
COORDINATE SYSTEM - NAD 1983
VERTICAL DATUM - NAVD 1988


LIMITS OF DISTURBANCE
25' M.B.S.L.
25.00'
WBSF
OUTFALL 1
PRE AREA (AC):
POST AREA (AC):
ELEVATION: 463.00
W088.796385
N035.637373
OUTFALL 2
PRE AREA (AC):
POST AREA (AC):
ELEVATION: 461.00
W088.795473
N035.637331
OUTFALL 3
PRE AREA (AC):
POST AREA (AC):
ELEVATION: 457.00
W088.794744
N035.637554
OUTFALL 4
PRE AREA (AC):
POST AREA (AC):
ELEVATION: 455.00
W088.794225
N035.637763
OUTFALL 5
PRE AREA (AC):
POST AREA (AC):
ELEVATION: 464.00
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N035.637675
OUTFALL 6
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N035.637466
OUTFALL 7
PRE AREA (AC):
POST AREA (AC):
ELEVATION: 452.00
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N035.637471
OUTFALL 8
PRE AREA (AC):
POST AREA (AC):
ELEVATION: 440.00
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N035.637401
OUTFALL 9
PRE AREA (AC):
POST AREA (AC):
ELEVATION: 442.00
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N039.637285
OUTFALL 10
PRE AREA (AC):
POST AREA (AC):
ELEVATION: 0.00
W088.790853
N035.636980
OUTFALL 11
PRE AREA (AC):
POST AREA (AC):
ELEVATION: 0.00
W088.790160
N035.635639
OUTFALL 12
PRE AREA (AC):
POST AREA (AC):
ELEVATION: 0.00
W088.790127
N035.634869
Carver Avenue
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WWC39
WWC40

EROSION CONTROL LEGEND

- - - - - - -	LIMITS OF CONSTRUCTION
—— WBSF —— WBSF ——	WIRE BACKED SILT FENCE
△	CHECK DAM
□	INLET PROTECTION
▨	LANDSCAPING/SUITABLE COVER

OUTFALL #	LATITUDE (N)	LONGITUDE (W)	APPROX. ELEV. (FEET)	PRE AREA (ACRES)	POST AREA (ACRES)	RECIEVING WATERS
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N

BEARING BASIS:
TENNESSEE STATE PLANE
COORDINATE SYSTEM - NAD 1983
VERTICAL DATUM - NAVD 1988

LEGEND

△——△	PROPERTY LINE	→	GUY WIRE
—— — — ——	PROPERTY ADJOINER LINE	☼	LIGHT POLE
—— —— ——	EASEMENT LINE (ESMT)	○	POWER POLE
—— – —— –	CENTERLINE OF ROAD	TR	ELECTRICTRANSFORMER
—— W —— W ——	WATER LINE	W	WATER METER
—— G —— G ——	GAS LINE	W	WATER VALVE
—— OE ——	OVERHEAD UTILITY LINE	G	NATURAL GAS METER
—— SS ——	SEWER LINE	G	NATURAL GAS VALVE
—— SD ——	STORM DRAIN LINE	SD	STORM MANHOLE
————	OVERHEAD COMS LINE	CB	CATCH BASIN
– · — · — ·	FLOW LINE	CO	CLEANOUT
– · · — · · —	DRAIN AREA LINE	●	SIGN
△	REBAR FOUND	⊗PED	TELEPHONE PEDESTAL
▲	5/8" REBAR WITH L.I. SMITH CAP SET		FIRE HYDRANT
●	UNMARKED POINT	S	SEWER MANHOLE
⊕	BENCHMARK	✳	DECIDUOUS TREE
□	CONCRETE SURFACE	✿	EVERGREEN TREE
▨	ASPHALT SURFACE		

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3. ALL GRADED AREAS, INCLUDING SLOPES, ARE TO BE STABILIZED AS SOON AS POSSIBLE AFTER GRADING IS COMPLETED, BUT NO LONGER THAN 14 DAYS LATER.

4. CONSTRUCT EROSION CONTROL AS SHOWN ON DRAWINGS PRIOR TO BEGINNING GRADING OPERATIONS.

5. ALL NEW STRUCTURES AND EXISTING STRUCTURES SHALL HAVE SEDIMENT REMOVED PRIOR TO ACCEPTANCE.

6. SILT BARRIERS SHALL BE CLEANED OF ACCUMULATED SEDIMENT WHEN APPROXIMATELY 33% FILLED WITH SUCH SEDIMENT.

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8. WHEN THE TEMPORARY SOIL EROSION AND WATER POLLUTION DEVICES ARE NO LONGER REQUIRED FOR THE INTENDED PURPOSE IN THE OPINION OF THE OWNER'S REPRESENTATIVE AND TOWN ENGINEER, THEY SHALL BE REMOVED.

9. REPLACE SILT BARRIERS WHEN CONDITIONS WARRANT AND AS DIRECTED BY THE OWNER'S REPRESENTATIVE AND TOWN ENGINEER.

10. ALL SLOPES 3:1 OR STEEPER SHALL BE STABILIZED WITH EROSION CONTROL MATTING INSTALLED PER MANUFACTURERS' RECOMMENDATIONS, OR SOD.

11. ANY MUD/CONSTRUCTION DEBRIS THAT MAY BE TRANSPORTED TO SURROUNDING ROADS, OR OTHER SURROUNDING ROADS OR PARKING AREAS SHALL BE CLEANED UP IMMEDIATELY.

12. GENERAL CONTRACTOR SHALL KEEP GROUND DISTURBANCE TO THE MINIMUM REQUIRED TO COMPLETE THE PROJECT. ALL AREAS MUST BE TEMPORARILY OR PERMANENTLY STABILIZED IF DISTURBED AREA HAS NOT BEEN WORKED WITHIN THE PAST 14 DAYS.

13. SOD SHALL BE TURF TYPE TALL FESCUE.

14. TIME OF EXPOSURE OF UNPROTECTED SOILS SHALL BE KEPT TO A MAXIMUM PERIOD OF 7 DAYS. TEMPORARY STABILIZATION MEASURES, I.E. SEEDING & MULCHING, SHALL BE PERFORMED ON ANY UNPROTECTED AREA WHERE CONSTRUCTION OPERATIONS WILL CEASE FOR 7 OR MORE DAYS.

15. KEEP DUST WITHIN TOLERABLE LIMITS BY SPRINKLING OR OTHER ACCEPTABLE MEANS.

16. USE TEMPORARY VEGETATION AND/OR MULCH TO PROTECT BARE AREAS FROM EROSION DURING CONSTRUCTION.

17. NO OTHER WORK WILL BE INITIATED ON THE PROJECT UNTIL THE EROSION/SILTATION MEASURES SHOWN ON THE PLANS AND DETAILS ARE PROPERLY IN PLACE.

18. IF, AT ANY TIME DURING THE CONSTRUCTION PHASE OF THIS PROJECT, THE EROSION/SILTATION MEASURES INSTALLED FAIL TO FUNCTION PROPERLY, NEED MAINTENANCE OR REPAIR, OR NEED NEW REPLACEMENT IN ANY KIND, THE CONTRACTOR WILL EFFECT SUCH ACTIONS AS ARE NEEDED TO CORRECT THE SITUATION AT NO ADDITIONAL COST TO THE OWNER.

19. DISTURBED AREAS ARE TO BE GRADED TO DRAIN AS INDICATED ON PLAN TO SEDIMENT BARRIERS DURING AND UPON COMPLETION OF CONSTRUCTION.

20. ALL CUT/FILL AREAS TO BE LANDSCAPED OR THAT HAVE A VEGETATIVE COVER POST-CONSTRUCTION, SHALL HAVE A MINIMUM OF 6-INCH DEPTH TOPSOIL COVER. AREAS DRESSED WITH TOPSOIL SHALL BE SODDED AS SHOWN ON SHEET L1, LANDSCAPING PLAN.

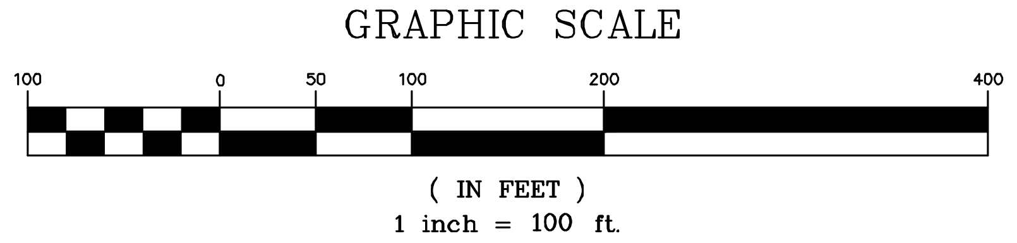
21. UPON STABILIZATION OF THE PROJECT SITE WITH A GOOD (ACCEPTABLE) STAND OF GRASS AND/OR GROUND COVER, THE EROSION/SILTATION INSTALLATIONS WILL BE REMOVED AND THE AREA DISTURBED WILL BE SODDED AS OTHER NEW GRASSED AREAS OF THE PROJECT.

SITE SPECIFIC EROSION CONTROL NOTES:

1. CONTRACTOR TO SOD ALL DISTURBED AREAS NOT OTHERWISE STABILIZED WITH LANDSCAPING (TYP.)

FLOODPLAIN NOTE:

THE SITE IS LOCATED IN UNSHADED FLOOD ZONE "X", AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS DETERMINED BY THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP NO. 471130168E, DATED AUGUST 03, 2009.



COMMUNITY DEVELOPMENT ENTERPRISES
SITE PLAN
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

REVISIONS

THIS DRAWING SHALL BE CONSIDERED PRELIMINARY IN NATURE AND, IN NO WAY, FINAL OR COMPLETE, UNLESS THE SEAL OF THE ENGINEER OR SURVEYOR OF RECORD IS AFFIXED HERETO.

SHEET: E.P.S.C PHASE 3
NUMBER: C-402

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DRAWN BY: NTG
CHECKED BY: WPS
SCALE: 1"=100'
PROJECT # 201044
DATE: 01/15/2021

SITE SPECIFIC UTILITY NOTES:

① POINT OF CONNECTION - GAS SERVICE (COORDINATE WITH UTILITY COMPANY PRIOR TO INSTALLATION)

② PROPOSED GAS METER LOCATION AND SERVICE LINE (INSTALL BY GAS COMPANY) (GC TO OPEN & CLOSE DITCH)

③ POINT OF CONNECTION - WATER SERVICE (COORDINATE WITH UTILITY COMPANY PRIOR TO INSTALLATION TO DETERMINE SIZE OF EXISTING MAIN

④ INSTALL GATE VALVE & BOX (PER PVUD)

⑤ INSTALL DOMESTIC WATER METER IN PIT (PER PVUD)

⑥ INSTALL 2" RPBP IN ABOVE GROUND HEATED ENCLOSURE PER PVUD STANDARDS AND SPECS

⑦ INSTALL 2" DOMESTIC WATER SERVICE (PER PVUD)

⑧ POINT OF CONNECTION - 1-1/2" FORCE MAIN SERVICE (COORDINATE WITH UTILITY COMPANY PRIOR TO INSTALLATION) (CONTRACTOR TO VERIFY INVERT AND LOCATION PRIOR TO CONSTRUCTION)

⑨ INSTALL 3,000 GALLONS S.T.E.P. TANK, INV. IN = 720.62 (PER PVUD SPECS.) (S.T.E.P. SYSTEM DESIGN BY PVUD - COORDINATE & VERIFY SIZE AND DIMENSIONS WITH PVUD PLANS PRIOR TO INSTALLATION) (MUST BE 2' MINIMUM FROM PROPERTY LINE) (S.T.E.P. TANK SYSTEM MUST BE INSTALLED BY A PVUD APPROVED CONTRACTOR)

⑩ INSTALL 2,000 GALLONS S.T.E.P. TANK WITH DUPLEX 35 GPM WITH 1HP-230 V MOTORS AND THE DUPLEX CONTROL PANELS, INV. IN = 720.30 (PER PVUD SPECS.) (THE ELECTRICAL REQUIREMENTS WILL BE A 60AMP DEDICATED CIRCUIT WITH A DISCONNECT AT THE CONTROL PANEL MOUNTING STRUCTURE. THIS STRUCTURE WILL BE BUILT OF UNI-STRUT MATERIAL AND SHALL BE WITHIN 4' OF THE PUMP SYSTEM. THE TANKS MUST BE PROTECTED FROM TRAFFIC BY PVUD APPROVED METHOD.) (INSTALL REMOTE ALARM PANEL INSIDE BUILDING NEAR MANAGER'S OFFICE) (THE TOP OF PUMP TANK SHALL BE A MAXIMUM OF 2' BELOW FINISHED GRADE) (IF THE PRIMARY TANK WILL NOT GRAVITY FLOW TO THE DOSING TANK, AN ADDITIONAL PUMP WILL BE REQUIRED IN THE PRIMARY TANK) (MUST BE 2' MINIMUM FROM PROPERTY LINE) (THE S.T.E.P. SEWER SYSTEM MUST BE INSTALLED BY AN APPROVED INSTALLER) (S.T.E.P. SYSTEM DESIGN BY PVUD - COORDINATE & VERIFY SIZE AND DIMENSIONS WITH PVUD PLANS PRIOR TO INSTALLATION) (S.T.E.P. TANK SYSTEM MUST BE INSTALLED BY A PVUD APPROVED CONTRACTOR)

⑪ INSTALL 8 L.F. OF 4" SDR 35 PVC @ 1.0%

⑫ INSTALL 56 L.F. OF 4" SDR 35 PVC @ 1.0%

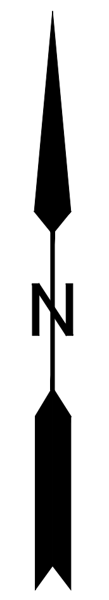
⑬ INSTALL 84 L.F. OF 4" SDR 35 PVC @ 1.0%

⑭ INSTALL TWO-WAY CLEANOUT WITH FLUSH BRASS CAP

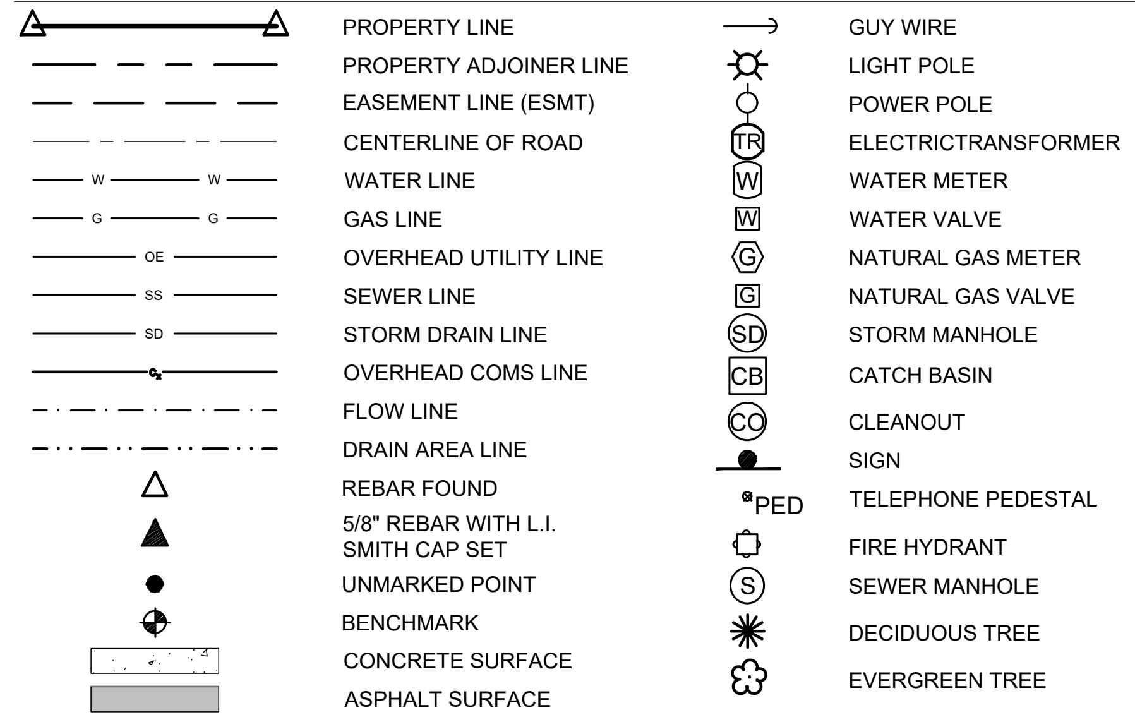
⑮ INSTALL CLEANOUT

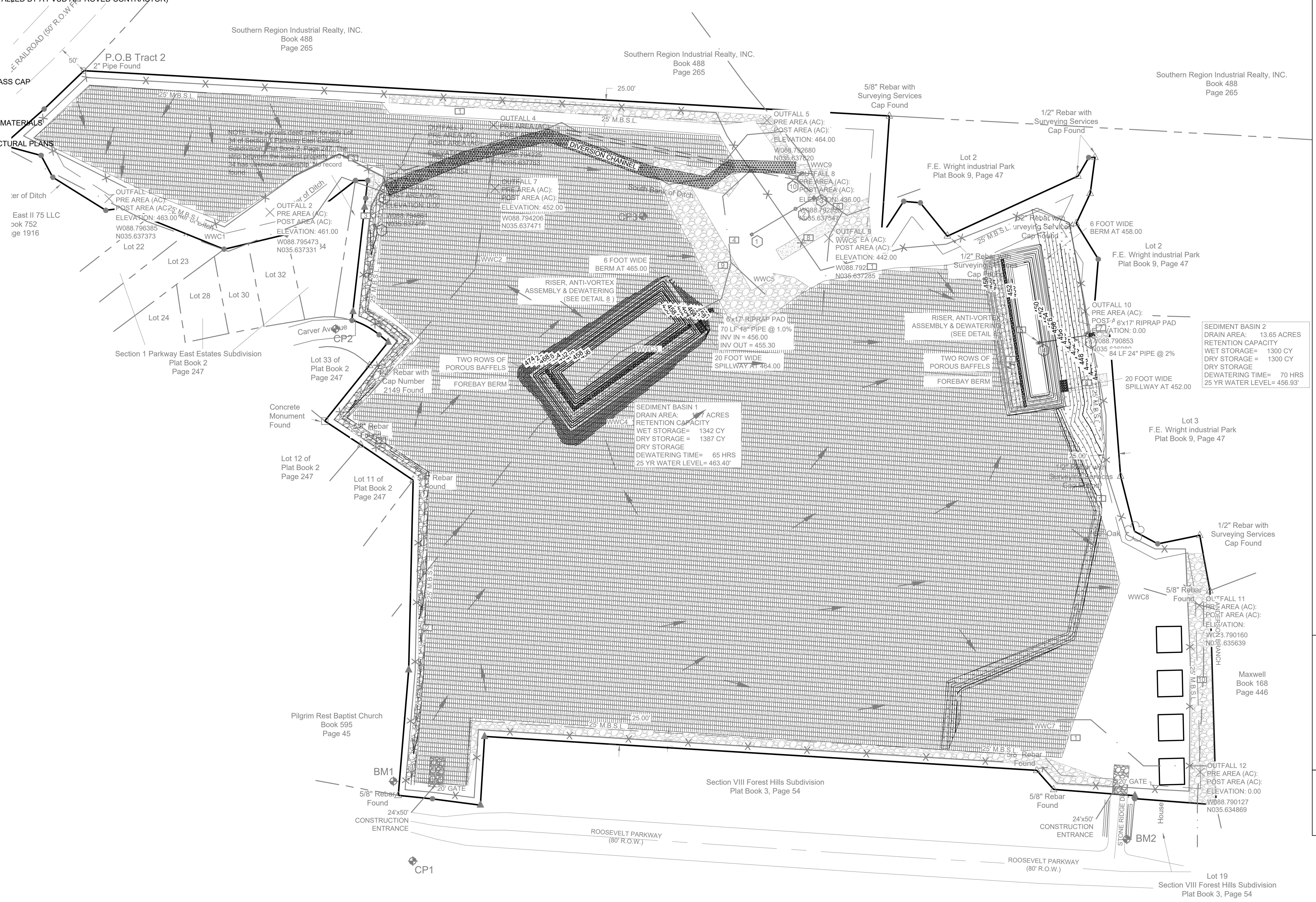
⑯ SAW CUT PAVEMENT AND REPLACE WITH LIKE MATERIALS

⑰ INSTALL GREASE INTERCEPTOR PER ARCHITECTURAL PLANS



BEARING BASIS:
TENNESSEE STATE PLANE
COORDINATE SYSTEM - NAD 1983
VERTICAL DATUM - NAVD 1988





UTILITY NOTES:

1. SANITARY SEWER CONSTRUCTION SHALL COMPLY WITH PLEASANT VIEW UTILITY DISTRICT (PVUD) STANDARDS.
2. WATER CONSTRUCTION SHALL COMPLY WITH PLEASANT VIEW UTILITY DISTRICT (PVUD) STANDARDS.
3. A MINIMUM SEPARATION OF 18" IS REQUIRED AT ANY LOCATION WHERE A WATER LINE CROSSES A SANITARY SEWER LINE. IF THIS SEPARATION CANNOT FEASIBLY BE OBTAINED. THE WATER LINE MUST BE INSTALLED IN SUCH A MANNER THAT NO JOINT IS WITHIN 5' OF THE SANITARY SEWER LINE AND A SEPARATION OF 6" MUST BE MAINTAINED. BOTH LINES MUST BE DUCTILE IRON PIPE.
4. A MINIMUM SEPARATION OF 18" IS REQUIRED AT ANY LOCATION WHERE A WATER LINE CROSSES A STORM DRAINAGE LINE.
5. WATER/SEWER LINE TRENCHES IN EXISTING DRIVEWAYS OR STREETS SHALL BE BACKFILLED WITH CRUSHED STONE TO THE TOP OF THE TRENCH.
6. SEWER LINE TRENCHES OUTSIDE EXISTING DRIVEWAYS OR STREETS SHALL BE BACKFILLED WITH #57 CRUSHED STONE TO 6" ABOVE THE PIPE AND BACKFILLED WITH A MIXTURE OF CLEAN EARTH, FREE OF ROCK NO LARGER THAN 1' SQ. AND DEBRIS, FROM THAT POINT TO THE TOP OF THE TRENCH, WHERE THE UTILITIES ARE LOCATED BENEATH OR NEAR PAVEMENT, BACKFILL THE TRENCHES WITH CRUSHED STONE TO SUBGRADE.
7. WATER LINES 4" OR LARGER TO BE PRESSURE CLASS 52 DUCTILE CAST IRON PIPE MADE OF GOOD QUALITY DUCTILE IRON THAT MEETS THE REQUIREMENTS FOR MODULAR IRON CASTINGS OF ASTM E8. IT SHALL BE PLAIN END DUCTILE IRON PIPE WITH PUSH-ON, SINGLE GASKET JOINTS. THE DESIGN THICKNESS SHALL BE THAT AS SPECIFIED BY AWWA C 151.
8. WATER LINES LESS THAN 3" SHALL BE REHAU-MUNICIPEX WITH STAINLESS STEEL INSERTS ON CITY SIDE OF METER, DEPTH OF PIPE IS TO BE NO LESS THAN 36" AND NO MORE THAN 42" UNDERGROUND. ON CUSTOMER SIDE OF METER, WATER LINES LESS THAN 3" TO BE REHAU-MUNICIPEX WITH STAINLESS STEEL INSERTS.
9. ALL WATER AND SANITARY LEADS TO BUILDING SHALL END 5' OUTSIDE THE BUILDING LIMITS AS SHOWN ON PLAN AND SHALL BE PROVIDED WITH A TEMPORARY PLUG AT END.
10. TELEPHONE UTILITY CONSTRUCTION SHALL COMPLY WITH AT&T SPECIFICATIONS.
11. ELECTRIC UTILITY CONSTRUCTION SHALL COMPLY WITH CUMBERLAND ELECTRIC MEMBERSHIP CORPORATION (CEMC) SPECIFICATIONS.
12. GENERAL CONTRACTOR SHALL FURNISH (1) - 4" SCHEDULE 40 PVC, ELECTRICAL GRADE CONDUIT FOR TELEPHONE SERVICE, REFERENCE PLAN FOR LOCATION. VERIFY LOCATION OF TIE IN FOR TELEPHONE COMPANY'S SERVICE LINE. PROVIDE NYLON PULL CORDS INSIDE CONDUIT. PROVIDE 1-30" SWEEP UP TO BACKER BOARD WITH #6 GROUND FROM ELECTRIC PANEL. AT&T TO PROVIDE AND PULL TELEPHONE WIRE. BACKER BOARD SHALL BE 3/4" FIRE RETARDANT PLYWOOD. PROVIDE 120V OUTLET WITHIN 6 FEET OF BACKER BOARD
13. REFER TO SITE ELECTRICAL PLANS FOR NUMBER AND SIZE OF CONDUITS FOR SECONDARY ELECTRIC SERVICE. CONDUIT SHALL BE INSTALLED AT LOCATIONS SHOWN ON THE SITE ELECTRICAL PLANS WITH MINIMUM COVER BELOW FINISHED GRADE, PER CODES AND CUMBERLAND ELECTRIC MEMBERSHIP CORP., WITH MULE TAPE PROVIDED IN CONDUIT. NO MORE THAN ONE SWEEP BEND OF 15' MINIMUM RADIUS WILL BE ALLOWED IN A CONDUIT RUN. CONDUITS SHALL BE BACKFILLED WITH MATERIAL FREE FROM STONES, ROCK, OR OTHER MATERIAL WHICH COULD DAMAGE THE CONDUIT AND NO MATERIAL LARGER THAN 2 INCHES. TRENCHES IN PAVED AREAS SHALL BE BACKFILLED WITH #67 STONE. LENGTH OF THE CONDUIT SHALL EXTEND TO 2 FEET BEYOND THE CURB AND GUTTER OR SIDEWALK UNLESS OTHERWISE INDICATED ON THE PLANS AND ENDS TAPED W/ DUCT TAPE. THE CONTRACTOR SHALL MARK LOCATIONS OF BURIED CONDUIT BY A SCORE LINE IN THE TOP OF THE CURB DURING PAVING OPERATIONS. GROUND WIRE AND WARNING TAPE TO BE INSTALLED IN TRENCH WITH CONDUIT. INSTALL UNDERGROUND ELECTRIC SERVICE PER CUMBERLAND ELECTRIC MEMBERSHIP CORP. SPECIFICATIONS.
14. PRIMARY ELECTRIC SERVICE SHALL BE 2-4" SCHEDULE 80 PVC, ELECTRICAL GRADE CONDUITS. CONDUIT SHALL BE INSTALLED AT LOCATIONS SHOWN ON THE SITE ELECTRICAL PLANS WITH MINIMUM COVER BELOW FINISHED GRADE, PER CODES AND CUMBERLAND ELECTRIC MEMBERSHIP CORP., WITH MULE TAPE PROVIDED IN CONDUIT. NO MORE THAN ONE SWEEP BEND OF 15' MINIMUM RADIUS WILL BE ALLOWED IN A CONDUIT RUN. CONDUITS SHALL BE BACKFILLED WITH MATERIAL FREE FROM STONES, ROCK, OR OTHER MATERIAL WHICH COULD DAMAGE THE CONDUIT AND NO MATERIAL LARGER THAN 2 INCHES. TRENCHES IN PAVED AREAS SHALL BE BACKFILLED WITH #67 STONE. LENGTH OF THE CONDUIT SHALL EXTEND TO 2 FEET BEYOND THE CURB AND GUTTER OR SIDEWALK UNLESS OTHERWISE INDICATED ON THE PLANS AND ENDS TAPED W/ DUCT TAPE. THE CONTRACTOR SHALL MARK LOCATIONS OF BURIED CONDUIT BY A SCORE LINE IN THE TOP OF THE CURB DURING PAVING OPERATIONS. GROUND WIRE AND WARNING TAPE TO BE INSTALLED IN TRENCH WITH CONDUIT. INSTALL UNDERGROUND ELECTRIC SERVICE PER CUMBERLAND ELECTRIC MEMBERSHIP CORP. SPECIFICATIONS.
15. GENERAL CONTRACTOR SHALL HAVE APPROVAL OF ALL GOVERNING AGENCIES HAVING JURISDICTION OVER THIS SYSTEM PRIOR TO INSTALLATION.
16. ALL APPROPRIATE FEES SHALL BE PAID PRIOR TO BEGINNING SITE UTILITY CONSTRUCTION.
17. GENERAL CONTRACTOR WILL BE RESPONSIBLE FOR ALL TAP AND TIE ON FEES REQUIRED, AS WELL AS COST OF UNDERGROUND SERVICE CONNECTIONS TO THE BUILDING.
18. ALL TRENCHING, PIPE LAYING, AND BACKFILLING SHALL BE IN ACCORDANCE WITH FEDERAL OSHA REGULATIONS.
19. THE OWNER / DEVELOPER, FOR BUDGET PURPOSES, SHOULD CHECK WITH THE TOWN OF PLEASANT VIEW PUBLIC WORKS FOR CONNECTION FEES WHICH MAY BE SUBSTANTIAL.
20. CONTRACTORS FOR SEWER WORK MUST BE APPROVED BY THE TOWN OF PLEASANT VIEW PUBLIC WORKS.

TRAFFIC CONTROL NOTES:

1. WHENEVER CONSTRUCTION OPERATIONS ENCROACH ON THE RIGHT-OF-WAY OF ADJACENT ROADWAYS, TRAFFIC CONTROL SHALL BE PROVIDED IN ACCORDANCE WITH LOCAL AND STATE STANDARDS.

2. NO MATERIALS OR EQUIPMENT SHALL BE STORED OR STOCKPILED WITHIN THE RIGHT-OF-WAY OF ADJACENT ROADWAYS.

3. ALL TRAFFIC CONTROL, INCLUDING MARKINGS, SIGNS, ETC. SHALL FOLLOW THE CURRENT EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

4. EXCAVATION AND LANE CLOSURE PERMITS ARE REQUIRED FOR ALL WORK DONE WITHIN THE PUBLIC RIGHT-OF-WAY.

HVAC NOTE:

HVAC UNITS ARE LOCATED ON THE ROOF.

FLOODPLAIN NOTE:

THE SITE IS LOCATED IN UNSHADED FLOOD ZONE "X", AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS DETERMINED BY THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP NO. 471130168E, DATED AUGUST 03, 2009.

GRAPHIC SCALE

(IN FEET)
1 inch = 100 ft.

COMMUNITY DEVELOPMENT ENTERPRISES
SITE PLAN
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

REVISIONS

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NUMBER: C-500

SHEET: UTILITIES

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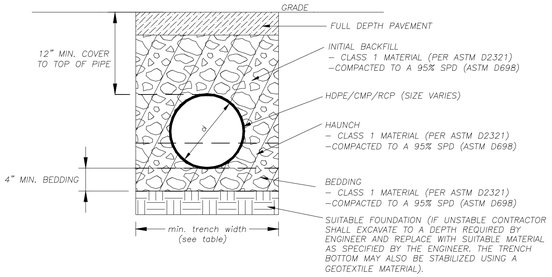
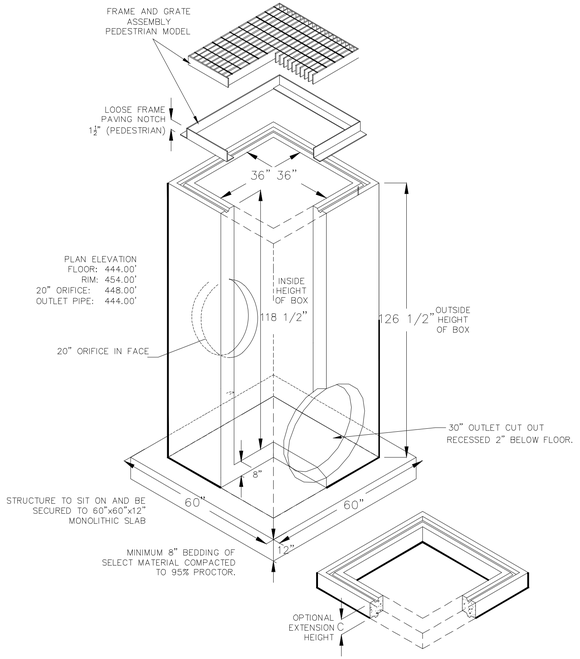
475 Metroplex Drive, Suite 212 Nashville, TN 37211 ı 615-256-0290

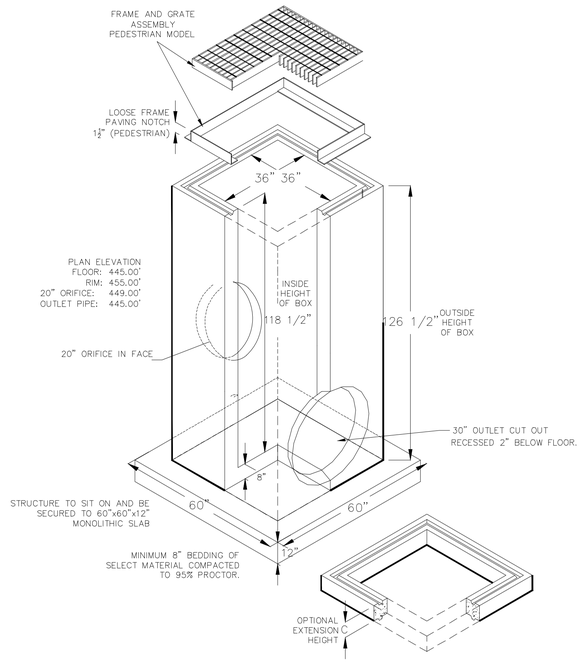
DRAWN BY: NTG
CHECKED BY: WPS
SCALE: 1"=100'
PROJECT # 201044
DATE: 01/15/2021



PIPE DIAMETER	MIN. TRENCH WIDTH
8" or smaller	26"
10"	32"
12"	36"
15"	39"
18"	46"
24"	54"
36"	70"

NOTE:
TRENCH WIDTHS, BEDDING MATERIALS AND COMPACTION REQUIREMENTS DEPICTED ARE MINIMUMS. CONTRACTOR SHALL INSTALL ALL PIPING PER MANUFACTURER'S WRITTEN INSTRUCTIONS OR ASTM D2321, UNLESS THESE DRAWINGS OR THE PROJECT SPECIFICATIONS ARE MORE STRINGENT.





COMMUNITY DEVELOPMENT ENTERPRISES
SITE PLAN
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

REVISIONS

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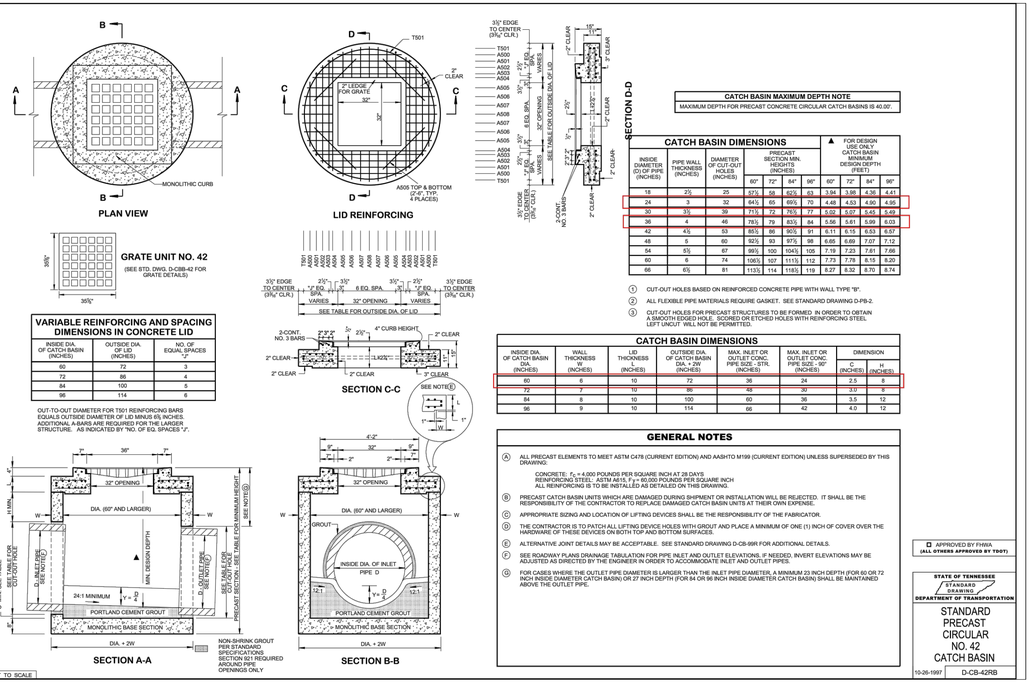
PROJECT #	201044	SCALE:	
		DATE:	01/15/2021

SHEET: SITE DETAILS

NUMBER: C-900



VARIABLE REINFORCING AND SPACING DIMENSIONS IN CONCRETE LID		
INSIDE DIA. OF CATCH BASIN (INCHES)	OUTSIDE DIA. OF LID (INCHES)	NO. OF EQUAL SPACES "n"
60	72	3
72	86	4
84	100	5
96	114	6

OUT-TO-OUT DIAMETER FOR T501 REINFORCING BARS EQUALS OUTSIDE DIAMETER OF LID MINUS 6½ INCHES. ADDITIONAL A-BARS ARE REQUIRED FOR THE LARGER STRUCTURE. AS INDICATED BY "NO. OF EQ. SPACES "n".

CATCH BASIN MAXIMUM DEPTH NOTE
MAXIMUM DEPTH FOR PRECAST CONCRETE CIRCULAR CATCH BASINS IS 40.00'.

CATCH BASIN DIMENSIONS							▲ FOR DESIGN DEPTH OF CATCH BASIN MINIMUM DESIGN DEPTH (FEET)			
INSIDE DIAMETER (D) OF PIPE (INCHES)	PIPE WALL THICKNESS (INCHES)	DIAMETER OF CUT-OUT HOLES (INCHES)	PRECAST SECTION MIN. HEIGHTS (INCHES)							
			60"	72"	84"	96"	60"	72"	84"	96"
18	2½	25	57½	59	60½	63	3.94	3.98	4.36	4.41
24	3	32	64½	65	69½	70	4.48	4.53	4.90	4.95
30	3½	39	71½	72	76½	77	5.02	5.07	5.45	5.49
36	4	46	78½	79	83½	84	5.56	5.61	5.99	6.03
42	4½	53	85½	86	90½	91	6.11	6.15	6.53	6.57
48	5	60	92½	93	97½	98	6.65	6.69	7.07	7.12
54	5½	67	99½	100	104½	105	7.19	7.23	7.61	7.66
60	6	74	106½	107	111½	112	7.73	7.78	8.15	8.20
66	6½	81	113½	114	118½	119	8.27	8.32	8.70	8.74

① CUT-OUT HOLES BASED ON REINFORCED CONCRETE PIPE WITH WALL TYPE "B".
② ALL FLEXIBLE PIPE MATERIALS REQUIRE GASKET. SEE STANDARD DRAWING D-PB-2.
③ CUT-OUT HOLES FOR PRECAST STRUCTURES TO BE FORMED IN ORDER TO OBTAIN A SMOOTH EDGED HOLE. SCORED OR ETCHED HOLES WITH REINFORCING STEEL LEFT UNCUT WILL NOT BE PERMITTED.

CATCH BASIN DIMENSIONS							
INSIDE DIA. OF CATCH BASIN DIA. (INCHES)	WALL THICKNESS W (INCHES)	LID THICKNESS L (INCHES)	OUTSIDE DIA. OF CATCH BASIN DIA. + 2W (INCHES)	MAX. INLET OR OUTLET CONC. PIPE SIZE - STR. (INCHES)	MAX. INLET OR OUTLET CONC. PIPE SIZE - 90° (INCHES)	DIMENSION	
						C (INCHES)	H (INCHES)
60	6	10	72	36	24	2.5	8
72	7	10	86	42	30	3.0	8
84	8	10	100	60	36	3.5	12
96	9	10	114	66	42	4.0	12

GENERAL NOTES

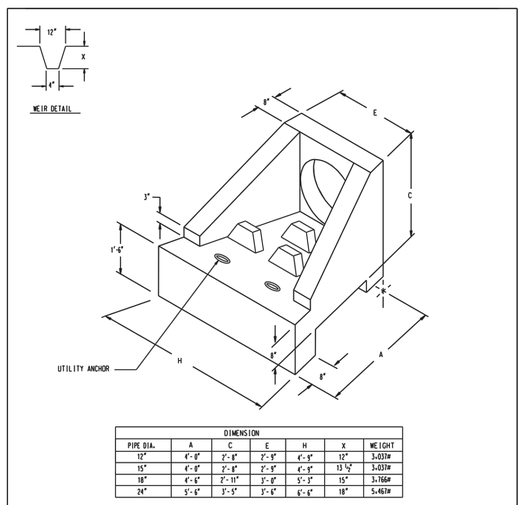
Ⓐ ALL PRECAST ELEMENTS TO MEET ASTM C478 (CURRENT EDITION) AND AASHTO M199 (CURRENT EDITION) UNLESS SUPERSEDED BY THIS DRAWING:
CONCRETE: f'_c = 4,000 POUNDS PER SQUARE INCH AT 28 DAYS
REINFORCING STEEL: ASTM A615, F_y = 60,000 POUNDS PER SQUARE INCH
ALL REINFORCING IS TO BE INSTALLED AS DETAILED ON THIS DRAWING.
Ⓑ PRECAST CATCH BASIN UNITS WHICH ARE DAMAGED DURING SHIPMENT OR INSTALLATION WILL BE REJECTED. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPLACE DAMAGED CATCH BASIN UNITS AT THEIR OWN EXPENSE.
Ⓒ APPROPRIATE SIZING AND LOCATION OF LIFTING DEVICES SHALL BE THE RESPONSIBILITY OF THE FABRICATOR.
Ⓓ THE CONTRACTOR IS TO PATCH ALL LIFTING DEVICE HOLES WITH GROUT AND PLACE A MINIMUM OF ONE (1) INCH OF COVER OVER THE HARDWARE OF THESE DEVICES ON BOTH TOP AND BOTTOM SURFACES.
Ⓔ ALTERNATIVE JOINT DETAILS MAY BE ACCEPTABLE. SEE STANDARD DRAWING D-CB-99R FOR ADDITIONAL DETAILS.
Ⓕ SEE ROADWAY PLANS DRAINAGE TABULATION FOR PIPE INLET AND OUTLET ELEVATIONS. IF NEEDED, INVERT ELEVATIONS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER IN ORDER TO ACCOMMODATE INLET AND OUTLET PIPES.
Ⓖ FOR CASES WHERE THE OUTLET PIPE DIAMETER IS LARGER THAN THE INLET PIPE DIAMETER, A MINIMUM 23 INCH DEPTH (FOR 60 OR 72 INCH INSIDE DIAMETER CATCH BASIN) OR 27 INCH DEPTH (FOR 84 OR 96 INCH INSIDE DIAMETER CATCH BASIN) SHALL BE MAINTAINED ABOVE THE OUTLET PIPE.

☐ APPROVED BY FHWA (ALL OTHERS APPROVED BY TDOT)

STATE OF TENNESSEE STANDARD DRAWING DEPARTMENT OF TRANSPORTATION

STANDARD PRECAST CIRCULAR NO. 42 CATCH BASIN

10-26-1997 | D-CB-42RB



DIMENSION						
PIPE DIA.	A	C	E	H	X	WEIGHT
12"	6'-8"	2'-8"	2'-9"	6'-9"	12"	3.037#
15"	6'-8"	2'-8"	2'-9"	6'-9"	13 ½"	3.037#
18"	6'-6"	2'-11"	3'-0"	5'-3"	15"	3.766#
24"	5'-6"	3'-5"	3'-6"	6'-6"	18"	5.467#

GENERAL NOTES:

1. 2" MIN. CONCRETE COVERAGE.
2. REIF. - #4 REBAR 12" C.C. EA. WAY.
3. HOLE SIZE = PIPE O.D. + 3".
4. ¾" CHAMFER OR ROUND ON ALL EXPOSED EDGES.

FORTERRA

ENERGY DISSIPATOR BLOCK 12"- 27" PIPE	SCALE: NTS	PH# 1-800-737-0707	DWG# ET-230
		DATE:01/23/12	SHEET# 1 OF 1

STD-17-52453-1BARREL...BOX9".DGN

1 @ 8 x 6 REINFORCED CONCRETE BOX BRIDGE

Maximum Fill Height ft	Dimensions ST in.	SB in.	WT in.	BW ft	Bars TST Size	No.	Spacing in.	Length ft	Bars TSB Size	No.	Spacing in.	Length ft	Bars BST Size	No.	Spacing in.	Length ft	Bars BSB Size	No.	Spacing in.	Length ft	Bars EWE Size	No.	Spacing in.	Length ft	Bars EWI Size	No.	Spacing in.	Length ft	Bars LNT No.	Bars LND No.	Bars WS No.	Concrete CY/LF	Reinf Steel LB/LF
No Fill	9.5	9	8	9.33	4	1	12	8.83	6	2	6	8.83	8	1	12	9.83	4	1	12	9.83	4	2	12	6.00	5	2	12	6.00	54	16	4	0.86	192
3	11	11	8	9.33	4	1	12	8.83	7	2	6	8.83	8	1	12	9.83	4	1	12	9.83	4	2	12	6.00	5	2	12	6.00	54	16	4	0.86	202
5	9	9	8	9.33	4	1	12	8.83	7	2	6	8.83	6	2	6	9.83	4	1	12	9.83	4	2	12	6.00	5	2	12	6.00	62	0	4	0.84	193
10	9	9	8	9.33	4	1	12	8.83	8	2	6	8.83	6	2	6	9.83	4	1	12	9.83	4	2	12	6.00	5	2	12	6.00	62	0	4	0.84	201
20	10	11	8	9.33	4	1	12	8.83	7	2	6	8.83	7	2	6	9.83	4	1	12	9.83	4	2	12	6.00	6	2	12	6.00	62	0	4	0.94	210
30	14	15	9	9.50	4	1	12	9.00	7	2	6	9.00	9	1	12	10.00	4	1	12	10.00	4	2	12	6.00	6	2	12	6.00	62	0	4	1.23	204
40	18	16	10	9.67	4	1	12	9.17	7	2	6	9.17	9	1	12	10.17	4	1	12	10.17	4	2	12	6.00	5	2	12	6.00	62	0	4	1.50	206
50	21	21	11	9.83	4	1	12	9.33	7	2	6	9.33	7	2	6	10.33	4	1	12	10.33	4	2	12	6.00	5	2	12	6.00	66	0	4	1.75	209
60	24	24	12	10.00	4	1	12	9.50	7	2	6	9.50	7	2	6	10.50	4	1	12	10.50	4	2	12	6.00	5	2	12	6.00	66	0	4	2.00	213

1 @ 8 x 7 REINFORCED CONCRETE BOX BRIDGE

Maximum Fill Height ft	Dimensions ST in.	SB in.	WT in.	BW ft	Bars TST Size	No.	Spacing in.	Length ft	Bars TSB Size	No.	Spacing in.	Length ft	Bars BST Size	No.	Spacing in.	Length ft	Bars BSB Size	No.	Spacing in.	Length ft	Bars EWE Size	No.	Spacing in.	Length ft	Bars EWI Size	No.	Spacing in.	Length ft	Bars LNT No.	Bars LND No.	Bars WS No.	Concrete CY/LF	Reinf Steel LB/LF
No Fill	9.5	9	8	9.33	4	1	12	8.83	6	2	6	8.83	8	1	12	9.83	4	1	12	9.83	4	2	12	7.00	5	2	12	7.00	58	16	4	0.91	198
3	11	11	8	9.33	4	1	12	8.83	7	2	6	8.83	8	1	12	9.83	4	1	12	9.83	4	2	12	7.00	5	2	12	7.00	58	16	4	1.01	208
5	9	9	8	9.33	4	1	12	8.83	7	2	6	8.83	6	2	6	9.83	4	1	12	9.83	4	2	12	7.00	5	2	12	7.00	66	0	4	0.89	200
10	9	9	8	9.33	4	1	12	8.83	8	2	6	8.83	6	2	6	9.83	4	1	12	9.83	4	2	12	7.00	5	2	12	7.00	66	0	4	0.89	217
20	10	11	8	9.33	4	1	12	8.83	7	2	6	8.83	7	2	6	9.83	4	1	12	9.83	4	2	12	7.00	7	2	12	7.00	66	0	4	0.98	224
30	14	16	10	9.67	4	1	12	9.17	7	2	6	9.17	6	2	6	10.17	4	1	12	10.17	4	2	12	7.00	5	4	6	7.00	66	0	4	1.38	217
40	18	19	11	9.83	4	1	12	9.33	7	2	6	9.33	9	1	12	10.33	4	1	12	10.33	4	2	12	7.00	5	4	6	7.00	66	0	4	1.66	222
50	21	21	12	10.00	4	1	12	9.50	7	2	6	9.50	7	2	6	10.50	4	1	12	10.50	4	2	12	7.00	7	2	12	7.00	70	0	4	1.98	233
60	24	24	13	10.17	4	1	12	9.67	7	2	6	9.67	7	2	6	10.67	4	1	12	10.67	4	2	12	7.00	5	4	6	7.00	70	0	4	2.14	235

1 @ 8 x 8 REINFORCED CONCRETE BOX BRIDGE

Maximum Fill Height ft	Dimensions ST in.	SB in.	WT in.	BW ft	Bars TST Size	No.	Spacing in.	Length ft	Bars TSB Size	No.	Spacing in.	Length ft	Bars BST Size	No.	Spacing in.	Length ft	Bars BSB Size	No.	Spacing in.	Length ft	Bars EWE Size	No.	Spacing in.	Length ft	Bars EWI Size	No.	Spacing in.	Length ft	Bars LNT No.	Bars LND No.	Bars WS No.	Concrete CY/LF	Reinf Steel LB/LF
No Fill	8.5	9	8	9.33	4	1	12	8.83	6	2	6	8.83	8	1	12	9.83	8	1	12	9.83	4	2	12	8.00	5	2	12	8.00	62	16	4	0.96	224
3	11	11	8	9.33	4	1	12	8.83	7	2	6	8.83	8	1	12	9.83	4	1	12	9.83	4	2	12	8.00	5	2	12	8.00	62	16	4	1.06	214
5	9	9	8	9.33	4	1	12	8.83	7	2	6	8.83	6	2	6	9.83	4	1	12	9.83	4	2	12	8.00	5	2	12	8.00	70	0	4	0.94	206
10	9	9	8	9.33	4	1	12	8.83	8	2	6	8.83	6	2	6	9.83	4	1	12	9.83	4	2	12	8.00	5	2	12	8.00	70	0	4	0.94	233
20	10	12	9	9.50	4	1	12	9.00	7	2	6	9.00	9	1	12	10.00	4	1	12	10.00	4	2	12	8.00	6	4	6	8.00	70	0	4	1.33	242
30	14	16	11	9.83	4	1	12	9.33	7	2	6	9.33	9	1	12	10.33	4	1	12	10.33	4	2	12	8.00	6	4	6	8.00	70	0	4	1.50	245
40	18	19	12	10.00	4	1	12	9.50	7	2	6	9.50	9	1	12	10.50	4	1	12	10.50	4	2	12	8.00	8	4	6	8.00	74	0	4	1.79	249
50	21	21	14	10.33	4	1	12	9.83	7	2	6	9.83	7	2	6	10.83	4	1	12	10.83	4	2	12	8.00	6	4	6	8.00	74	0	4	2.10	260
60	24	24	15	10.50	4	1	12	10.00	7	2	6	10.00	7	2	6	11.00	4	1	12	11.00	4	2	12	8.00	6	4	6	8.00	74	0	4	2.37	281

Note: Maximum fill height shown in the table is measured from the bottom of the top slab. To obtain the total fill height from the flow line, add the height of the box.
Note: When height of fill above the top slab is less than 1 foot, the top mat of reinforcing in the top slab shall be constructed with 2-1/2 inches of concrete cover.

The following bar information applies to all fill cases in the tables above:
Bars LNT Size = 4 Spacing = 12 in.
Bars LND Size = 5 Spacing = 6 in.
Bars WS Size = 8 Length = 5.00 ft. Spacing = 12 in.

DESIGNED BY: BLL/GLP DATE: 12-09
DRAWN BY: TEXTA MARTINEZ DATE: 1-10
SUPERVISED BY: TW/WJC DATE: 12-09
CHECKED BY: BLL/GLP DATE: 1-10

CONST. NO.

PROJECT NO.	YEAR	SHEET NO.
	2010	

REVISIONS

NO.	DATE	BY	BRIEF DESCRIPTION

BOX BRIDGE

SLAB BRIDGE

TYPICAL SECTIONS

NOTE: TWO BARREL TYPICAL SECTIONS SHOWN. SINGLE BARREL AND THREE BARREL ARE SIMILAR.

NOTE: SEE "ALTERNATE BOTTOM SLAB DETAIL" THIS SHEET.

JOINT DETAIL FOR WALL TO SLAB OR FOOTING

JOINT DETAIL FOR INTERIOR WALL TO BOTTOM SLAB

BOX OR SLAB BRIDGE

BOX BRIDGE

▲ BAR TST OR BAR BSB MUST BE DISCONTINUOUS AT THE GROOVE. THE GROOVE SHALL ALIGN WITH CENTER OF INTERIOR WALL. BAR TST OR BAR BSB SHALL BE CENTERED WITH RESPECT TO THE CELL WIDTH.

■ BUTYL RUBBER OR NEOPRENE STRIP 12 INCH WIDE BY ½ INCH THICK SHALL COVER THE FULL LENGTH OF THE GROOVE IN THE TOP SLAB. STRIP MUST BE GLUED TO THE SLAB UTILIZING CONTACT CEMENT OVER 100% OF THE CONTACT AREA.

■■DENOTES: ALTERNATE POSITION OF 2'-0" LEG FROM SIDE TO SIDE.

MOMENT BREAK DETAIL FOR MULTIPLE BARREL BOX ℄ SLAB BRIDGES

NOTE: MANDATORY FOR FILL HEIGHTS GREATER THAN 10 FEET.

BOX DIMENSION DESIGNATIONS

THE BOX DIMENSION DESIGNATIONS IDENTIFY THE BOX ELEMENTS AS FOLLOWS:

SB = BOTTOM SLAB THICKNESS
ST = TOP SLAB THICKNESS
WT = EXTERIOR WALL THICKNESS
IT = INTERIOR WALL THICKNESS
BW = BOX WIDTH

REINFORCING BAR DESIGNATIONS

THE REINFORCING BAR DESIGNATIONS IDENTIFY THE LOCATION AND PLACEMENT OF THE BARS AS FOLLOWS:

TST = TOP SLAB, TOP FACE
TSB = TOP SLAB, BOTTOM FACE
BST = BOTTOM SLAB, TOP FACE
BSB = BOTTOM SLAB, BOTTOM FACE
EWE = EXTERIOR WALL, EXTERIOR FACE
EWI = EXTERIOR WALL, INTERIOR FACE
IW = INTERIOR WALL, BOTH FACES
LNT = LONGITUDINAL BAR
LND = LONGITUDINAL DISTRIBUTION BAR, TOP SLAB, BOTTOM FACE
WS = CONNECTION WALL TO SLAB
WF = CONNECTION WALL TO FOOTING
EWF = EXTERIOR WALL FOOTING
IWF = INTERIOR WALL FOOTING

ALTERNATE BOTTOM SLAB DETAIL

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

TYPICAL SECTIONS AND DETAILS

STANDARD REINFORCED CONCRETE BRIDGE BOX AND SLAB TYPE

2010

CORRECT Edward P. Wasserman
ENGINEER OF STRUCTURES

STD-17-5

STD175.DGN

PLAN VIEW FOR BOX CULVERTS ON 90 DEGREE SKEW TO CENTERLINE

PLAN VIEW FOR BOX CULVERTS ON VARIABLE DEGREE SKEW TO CENTERLINE

REVISIONS			
M/R	NO.	DATE	BY / BRIEF DESCRIPTION
M/R	1	4-20-18	AT / REVISED ASTM SPECIFICATION NUMBER

M/R DENOTES MINOR REVISION, FHWA APPROVAL NOT REQUIRED.

GENERAL NOTES

① PAVED OUTLET DETAIL IS TO BE USED ONLY WHEN SPECIFIED IN DESIGN PLANS.

② CONCRETE PAVED OUTLETS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, SECTIONS 204 AND 604 OR CURRENT SPECIAL PROVISIONS.

CONCRETE: CLASS "A", F'c = 3000 PSI MINIMUM AT 28 DAYS.

REINFORCING STEEL: ASTM A615 GRADE 60

WELDED WIRE REINFORCEMENT: DETAILS AND PLACEMENT TO CONFORM TO CURRENT CMS STANDARDS. THE MATERIALS TO CONFORM TO ASTM A1064. ⚠

FOUNDATION FILL MATERIAL: TO BE SAME AS THAT REQUIRED BY THE STANDARD SPECIFICATIONS FOR USE UNDER THE PROPOSED CONCRETE BOX CULVERTS.

FORMS AND FINISH: TO CONFORM TO STANDARD SPECIFICATIONS.

③ CONCRETE JOINT MATERIAL IS TO BE ½" x 6" PREMOLDED FIBER IN ACCORDANCE WITH SECTION 905 - JOINT MATERIALS OF THE STANDARD SPECIFICATIONS, COST IS TO BE INCLUDED IN THE UNIT PRICE BID FOR CLASS "A" CONCRETE (BOX BRIDGES).

④ PAYMENT WILL BE MADE AS FOLLOWS:

FOUNDATION FILL MATERIAL: PER CUBIC YARD.
CLASS "A" CONCRETE (BOX BRIDGES): PER CUBIC YARD.
STEEL BAR REINFORCEMENT (BOX BRIDGES): PER POUND.

NOTES:

① WELDED WIRE REINFORCEMENT: TO BE 6" x 6" NO. 4 GAUGE WELDED WIRE AT 58 LBS./100 SQ.FT., WITH 9" MINIMUM LAP. WIRE TO CONFORM TO ASTM A1064 SPECIFICATIONS. THE WIRE IS TO EXTEND TO WITHIN 3" OF THE EDGE OF THE SLAB AND SHALL BE PLACED AT ONE HALF THE DEPTH OF THE SLAB. ⚠

② THE CONTRACTOR MAY SUBSTITUTE AN EQUIVALENT AREA OF ASTM NUMBER 3 REINFORCING BARS FOR THE 6" x 6" NO. 4 WELDED WIRE REINFORCEMENT.

ESTIMATED QUANTITIES

6" x 6" NO. 4 GAUGE WELDED WIRE REINFORCEMENT	REINFORCING STEEL (A500 BARS)	CONCRETE CLASS "A" SLAB	CONCRETE CLASS "A" CUT-OFF WALL	CONCRETE CLASS "A" SILL
58 LBS./100 SQ.FT.	3,330 LBS. PER A500 BAR	0.019 C.Y. PER SQ.FT.	0.019 C.Y. PER LIN.FT.	0.019 C.Y. PER LIN.FT.

SECTION A-A

CONSTRUCTION JOINT DETAIL

SILL DETAIL

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PAVED OUTLET DETAIL

STANDARD REINFORCED CONCRETE BRIDGE BOX TYPE

2010

CORRECT Edward P. Wasserman
ENGINEER OF STRUCTURES

STD-17-19

DESIGNED BY: ENM / MAH DATE: 12-09
DRAWN BY: DEANNE BUSH DATE: 09-10
SUPERVISED BY: BLL/JT / JWP / MAH DATE: 12-09
CHECKED BY: DATE:

NRI000052

COMMUNITY DEVELOPMENT ENTERPRISES

SITE PLAN

ROOSEVELT PARKWAY

JACKSON, MADISON COUNTY, TENNESSEE

REVISIONS

THIS DRAWING SHALL BE CONSIDERED PRELIMINARY IN NATURE AND, IN NO WAY, FINAL OR COMPLETE, UNLESS THE SEAL OF THE ENGINEER OR SURVEYOR OF RECORD IS AFFIXED HERETO.

SHEET: SITE DETAILS

NUMBER: C-901

L.I. Smith and Associates, Inc.
LAND DEVELOPMENT | INFRASTRUCTURE DESIGN
SURVEYING SERVICES
302 North Caldwell Street, Paris, TN 38242 | 731-644-1014 | www.lismith.com
475 Metroplex Drive, Suite 212 Nashville, TN 37211 | 615-256-0290

DRAWN BY: NTG | CHECKED BY: WPS | SCALE:

PROJECT # 201044 | DATE: 01/15/2021

STD173.DGN

NOTE: SEE TABLES ON STANDARD DRAWINGS STD-17-11 THRU 14 FOR WINGWALL DIMENSIONS

W = WINGWALL LENGTH FOR 90° SKEW
WL = LENGTH OF LONG WINGWALL FOR SKEWS OTHER THAN 90°
WS = LENGTH OF SHORT WINGWALL FOR SKEWS OTHER THAN 90°
H = HEIGHT AT BEGINNING OF WINGWALL
h = MIN. HEIGHT OF END OF WINGWALL FOR 90° SKEW
hl = MIN. HEIGHT OF END OF LONG WINGWALL FOR SKEWS OTHER THAN 90°
hs = MIN. HEIGHT OF END OF SHORT WINGWALL FOR SKEWS OTHER THAN 90°

ELEVATION VIEW OF WINGWALL

TYPICAL CORNER DETAIL

CONST. NO.		
PROJECT NO.	YEAR	SHEET NO.
	2010	

REVISIONS

NO.	DATE	BY	BRIEF DESCRIPTION

NOTES

1. WALL JOINTS - AN EXPANSION JOINT IS REQUIRED AT THE LOCATION SHOWN ON THIS DRAWING FOR ALL BOX BRIDGES, AND FOR SLAB BRIDGES WHENEVER THE WINGWALL LENGTH IS GREATER THAN 15 FEET. FOR WINGWALLS GREATER THAN 30 FEET, PLACE A CONTRACTION JOINT AT MID-LENGTH OF WINGWALL.
   IF PLASTICATION GROOVES ARE USED, THE JOINTS SHALL BE SPACED TO CORRESPOND WITH PLASTICATIONS. WATERSTOPS SHALL MEET THE REQUIREMENTS OF SPECIFICATION ARTICLES 604-29 AND 908-10. JOINT MATERIAL SHALL MEET THE REQUIREMENTS OF SPECIFICATION ARTICLE 604-30. SECTION 905, FOOTING AND FOOTING REINFORCEMENT SHALL BE CONTINUOUS.

NOTE: STOP KEY 1'-0" BELOW TOP OF WALL

CONTRACTION JOINT

EXPANSION JOINT DETAIL

d DENOTES WIDTH OF WINGWALL

● DENOTES HOLLOW BULB TYPE RUBBER OR PLASTIC WATERSTOP

TYPICAL KEY DETAIL

▲ DENOTES ¾ THICKNESS FOR 9" HOLLOW BULB TYPE RUBBER OR PLASTIC WATERSTOP

THE EXPANSION JOINT SHALL BE USED IN THE WALL ONLY AND NOT CARRIED THROUGH THE FOOTING. NO REINFORCEMENT SHALL PASS THROUGH THE JOINT. ONE END OF THE DOWELS SHALL BE WRAPPED IN A LAYER OF TARPAPER WITH A TARPAPER CAP OVER THE END. THE COST OF THE BITUMINOUS FIBER AND DOWEL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CLASS A CONCRETE.

WALL JOINT DETAILS

NOTE: USE RIP-RAP OR PAVED OUTLET AT ENDS OF BOX AND SLAB BRIDGES AS SPECIFIED ON THE ROADWAY PLANS.

PLAN VIEW OF WINGWALLS

(90° SKEW SHOWN, OTHER SKEWS SIMILAR)

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

TYPICAL WINGWALL DETAILS AND NOTES

STANDARD REINFORCED CONCRETE BRIDGE BOX AND SLAB TYPE

2010

CORRECT Edward P. Wasserman
DIRECTOR OF STRUCTURES

STD-17-10

DESIGNED BY: ENH / MAH — DATE: 12-09
DRAWN BY: REANE BUSH — DATE: 01-10
SUPERVISED BY: ENH / MAH — DATE: 12-09
CHECKED BY: — DATE:

STD174.DGN

45° SKEW

2:1 SLOPE

H	WL	hl	WS	hs	CONCRETE (C.Y.)	REINF. STEEL (LBS.)
4	9,75	2,50	4,50	1,75	4,8	720
4,5	11,00	2,75	5,00	1,75	5,9	782
5	12,25	3,25	5,50	2,00	7,6	886
5,5	13,75	3,50	6,25	2,25	9,1	1,067
6	15,00	3,75	6,75	2,50	10,6	1,173
6,5	16,25	4,25	7,25	2,75	12,2	1,242
7	17,75	4,50	8,00	3,00	14,1	1,614
7,5	19,00	4,75	8,50	3,00	16,4	1,731
8	20,25	5,25	9,00	3,25	19,1	1,678
8,5	21,50	5,50	9,75	3,50	21,3	2,090
9	23,00	5,75	10,25	3,75	24,6	3,137
9,5	24,25	6,25	10,75	4,00	27,3	3,253
10	25,50	6,50	11,50	4,00	29,9	3,573
10,5	26,75	6,75	12,00	4,25	32,6	3,756
11	28,25	7,25	12,50	4,50	37,7	4,237
11,5	29,50	7,50	13,25	4,75	42,4	5,191
12	30,75	7,75	13,75	5,00	46,1	5,566
12,5	32,25	8,25	14,25	5,25	50,2	5,730
13	33,50	8,50	15,00	5,25	57,0	6,753
13,5	34,75	8,75	15,50	5,50	60,9	7,336
14	36,00	9,00	16,00	5,75	66,2	7,741
14,5	37,50	9,50	16,75	6,00	71,5	8,221
15	38,75	9,75	17,25	6,25	80,1	8,868
15,5	40,00	10,00	17,75	6,50	84,8	9,888
16	41,25	10,50	18,50	6,50	90,3	10,387
16,5	42,75	10,75	19,00	6,75	95,3	12,228
17	44,00	11,00	19,75	7,00	109,5	13,789
17,5	45,25	11,50	20,25	7,25	115,7	13,669
18	46,75	11,75	20,75	7,50	122,1	14,206
18,5	48,00	12,00	21,50	7,75	128,6	14,503
19	49,25	12,50	22,00	7,75	143,7	15,966
19,5	50,50	12,75	22,50	8,00	148,4	18,028
20	52,00	13,00	23,25	8,25	161,3	19,025
20,5	53,25	13,50	23,75	8,50	169,2	19,598
21	54,50	13,75	24,25	8,75	189,1	21,559

3:1 SLOPE

H	WL	hl	WS	hs	CONCRETE (C.Y.)	REINF. STEEL (LBS.)
4	11,25	3,00	5,50	2,00	6,0	765
4,5	12,75	3,25	6,25	2,25	7,3	845
5	14,25	3,75	7,00	2,50	9,4	967
5,5	15,75	4,00	7,75	2,75	11,1	1,067
6	17,25	4,50	8,50	3,00	13,0	1,273
6,5	18,75	4,75	9,25	3,25	14,9	1,376
7	20,25	5,25	10,00	3,50	18,4	1,726
7,5	21,75	5,50	10,75	3,75	20,8	1,935
8	23,25	6,00	11,50	4,00	22,9	2,087
8,5	24,75	6,25	12,25	4,50	26,2	2,302
9	26,25	6,75	13,00	4,75	30,4	3,505
9,5	27,75	7,00	13,50	5,00	34,3	3,703
10	29,25	7,50	14,25	5,25	37,8	4,078
10,5	30,75	7,75	15,00	5,50	41,3	4,239
11	32,25	8,25	15,75	5,75	46,6	4,795
11,5	33,50	8,50	16,50	6,00	51,9	5,807
12	35,00	8,75	17,25	6,25	56,1	6,256
12,5	36,50	9,25	18,00	6,50	61,9	6,514
13	38,00	9,50	18,75	6,75	70,3	7,623
13,5	39,50	10,00	19,50	7,00	76,2	8,259
14	41,00	10,25	20,25	7,25	81,5	8,673
14,5	42,50	10,75	21,00	7,50	87,3	9,183
15	44,00	11,00	21,50	7,75	101,3	10,056
15,5	45,50	11,50	22,25	8,00	107,9	11,271
16	47,00	11,75	23,00	8,25	114,3	11,918
16,5	48,50	12,25	23,75	8,50	121,4	14,221
17	50,00	12,50	24,50	8,75	132,4	15,415
17,5	51,50	13,00	25,25	9,00	145,7	15,580
18	53,00	13,25	26,00	9,25	153,4	16,233
18,5	54,50	13,75	26,75	9,50	161,8	16,591
19	56,00	14,00	27,50	9,75	177,0	18,233
19,5	57,50	14,50	28,25	10,00	187,1	20,634
20	59,00	14,75	29,00	10,25	196,0	21,405
20,5	60,50	15,25	29,75	10,50	212,2	22,465
21	61,75	15,50	30,25	10,75	234,6	24,397

4:1 SLOPE

H	WL	hl	WS	hs	CONCRETE (C.Y.)	REINF. STEEL (LBS.)
4	12,25	3,25	6,50	2,25	6,9	806
4,5	13,75	3,50	7,25	2,75	8,3	887
5	15,50	4,00	8,00	3,00	10,7	1,023
5,5	17,00	4,25	9,00	3,25	12,5	1,225
6	18,75	4,75	9,75	3,50	14,7	1,360
6,5	20,25	5,25	10,50	3,75	17,4	1,474
7	21,75	5,50	11,50	4,00	20,6	1,685
7,5	23,50	6,00	12,25	4,50	23,5	2,029
8	25,00	6,25	13,00	4,75	26,2	2,183
8,5	26,50	6,75	14,00	5,00	29,7	2,451
9	28,25	7,25	14,75	5,25	35,0	3,819
9,5	29,75	7,50	15,50	5,50	38,3	3,973
10	31,25	8,00	16,50	6,00	42,4	4,366
10,5	33,00	8,25	17,25	6,25	46,3	4,594
11	34,50	8,75	18,00	6,50	52,0	5,106
11,5	36,00	9,00	19,00	6,75	59,3	6,335
12	37,75	9,50	19,75	7,00	64,9	6,794
12,5	39,25	10,00	20,50	7,25	70,0	6,997
13	40,75	10,25	21,25	7,75	79,3	8,146
13,5	42,50	10,75	22,25	8,00	85,6	8,858
14	44,00	11,00	23,00	8,25	94,5	9,374
14,5	45,75	11,50	23,75	8,50	101,2	9,976
15	47,25	12,00	24,75	8,75	113,9	10,756

6:1 SLOPE

H	WL	hl	WS	hs	CONCRETE (C.Y.)	REINF. STEEL (LBS.)
4	13,25	3,50	7,50	2,75	7,8	847
4,5	15,00	3,75	8,50	3,00	9,4	940
5	16,75	4,25	9,50	3,50	12,2	1,090
5,5	18,50	4,75	10,50	3,75	14,4	1,304
6	20,25	5,25	11,50	4,00	17,4	1,462
6,5	22,00	5,50	12,50	4,50	20,0	1,584
7	23,50	6,00	13,25	4,75	23,4	1,990

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

WINGWALL DIMENSIONS AND QUANTITIES

STANDARD REINFORCED CONCRETE BRIDGE BOX AND SLAB TYPE

2010

CORRECT Edward P. Wasserman
DIRECTOR OF STRUCTURES

STD-17-14

CONST. NO.		
PROJECT NO.	YEAR	SHEET NO.
	2010	

REVISIONS

NO.	DATE	BY	BRIEF DESCRIPTION

NOTE: QUANTITIES ON THIS SHEET ARE ESTIMATED TOTALS FOR ALL FOUR WINGWALLS.

NOTE: ADDITIONAL CONCRETE AND REINFORCEMENT QUANTITIES FOR BOX CULVERT CUT-OFF WALL SHALL BE ADJUSTED BASED ON AS-BUILT DIMENSIONS.

COMMUNITY DEVELOPMENT ENTERPRISES
SITE PLAN
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

SHEET: SITE DETAILS | NUMBER: C-902

L.I. Smith and Associates, Inc.
LAND DEVELOPMENT | INFRASTRUCTURE DESIGN
SURVEYING SERVICES

302 North Caldwell Street, Paris, TN 38242 | 731-644-1014 | www.lismith.com
475 Metroplex Drive, Suite 212 Nashville, TN 37211 | 615-256-0290

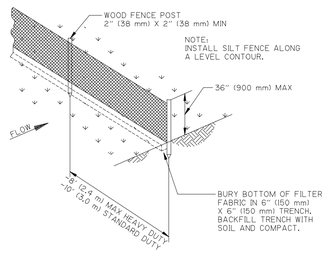
DRAWN BY: NTG | CHECKED BY: WPS | SCALE:
PROJECT # 201044 | DATE: 01/15/2021

THIS DRAWING SHALL BE CONSIDERED PRELIMINARY IN NATURE AND, IN NO WAY, FINAL OR COMPLETE, UNLESS THE SEAL OF THE ENGINEER OR SURVEYOR OF RECORD IS AFFIXED HERETO.

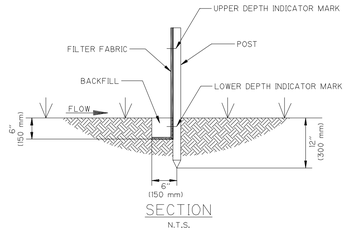
REVISIONS

ACTIVITY: Silt Fence

TCP – 13



TYPICAL PREFABRICATED
SILT FENCE INSTALLATION
N.T.S.



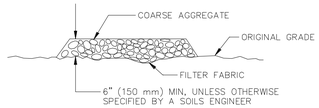
SECTION
N.T.S.

Figure TCP-13-1
Silt Fence Anchoring

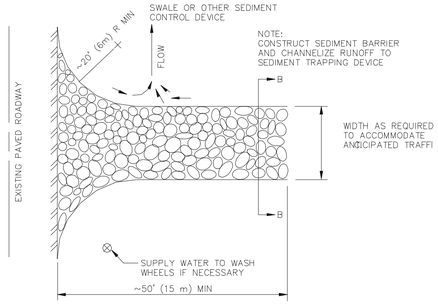
4.01 *SILT FENCE*
NO SCALE

ACTIVITY: Stabilized Construction Entrance

TCP – 03



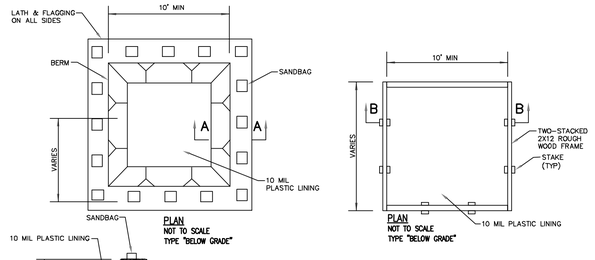
SECTION B–B
N.T.S.



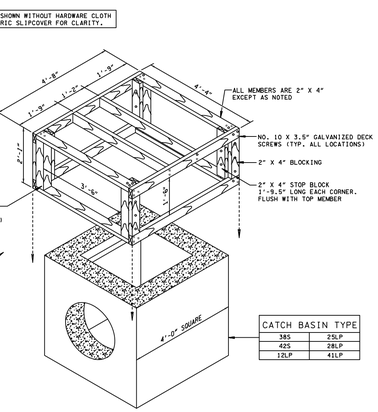
PLAN VIEW
N.T.S.

Figure TCP-03-1
Stabilized Construction Entrance

4.02 *CONSTRUCTION ENTRNACE*
NO SCALE

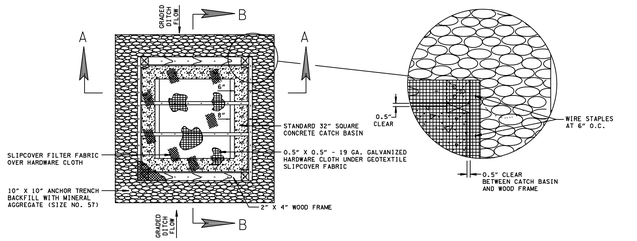


24 *CONCRETE WASHOUT*
NO SCALE

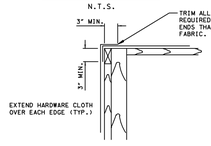


CATCH BASIN TYPE	
38S	25LP
42S	28LP
12LP	41LP

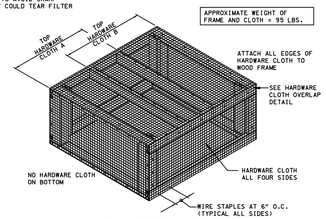
ISOMETRIC VIEW
CATCH BASIN FILTER ASSEMBLY
N.T.S.



PLAN VIEW - CATCH BASIN
FILTER ASSEMBLY
N.T.S.



HARDWARE CLOTH
OVERLAP DETAIL
N.T.S.



ISOMETRIC VIEW
FRAME WITH HARDWARE CLOTH
N.T.S.

EROSION CONTROL PLAN LEGEND: ① CATCH BASIN FILTER ASSEMBLY (TYPE 1)

CATCH BASIN FILTER ASSEMBLY GENERAL NOTES

(A) DRAWING TO BE USED WITH STANDARD TYPES 38S, 42S, AND D-CB-SERIES LP CATCH BASINS. SEE STANDARD DRAWINGS FOR CATCH BASIN DIMENSIONS AND DETAILS.

(B) THE CATCH BASIN FILTER ASSEMBLY IS TO BE USED WHERE INTERCEPTION OF CONCENTRATED FLOWS (e.g. DITCHES AND SWALES) IS REQUIRED AFTER STRUCTURES ARE CONSTRUCTED BUT PRIOR TO ESTABLISHING VEGETATION.

(C) 2 x 4 AND 4 x 4 PRESSURE TREATED MEMBERS SHOWN ARE NOMINAL DIMENSIONS. TYPICAL ACTUAL DIMENSIONS ARE 1.5 x 3.5 INCH AND 3.5 x 3.5 INCH RESPECTIVELY. ACTUAL DIMENSIONS OF WOOD MAY VARY EVEN GREATER DEPENDING ON MOISTURE CONTENT. ALL WOOD SHALL BE NO. 2 PRESSURE TREATED SOUTHERN YELLOW PINE.

(D) PERIODIC MAINTENANCE AND CLEANING OF THE STRUCTURE SHALL BE PERFORMED AS NECESSARY TO PREVENT CLOGGING OF THE FILTER FABRIC. FILTER ASSEMBLY MAY BE CLEANED AT AN ACCEPTABLE LOCATION WITH WATER OR BY BRUSHING AND BLOWING CLEAN WITH COMPRESSED AIR. MAINTENANCE AND CLEANING OF STRUCTURES WILL NOT BE MEASURED AND PAID FOR DIRECTLY BUT SHALL BE INCLUDED IN THE PRICE BID FOR THE STRUCTURE.

CATCH BASIN FILTER ASSEMBLY GENERAL NOTES (CONT.)

(E) DEFECTIVE WOOD, HARDWARE CLOTH OR FILTER FABRIC SHALL BE REPLACED AS NECESSARY TO INSURE PROPER FUNCTIONING OF FILTER ASSEMBLY. REUSE OF ASSEMBLIES IS ACCEPTABLE PROVIDED THE UNIT IS IN PROPER WORKING CONDITION. APPROVAL MUST BE GIVEN BY TDOT ENGINEER.

(F) ASSEMBLY AND STONE SHALL BE REMOVED AFTER UPSTREAM VEGETATION HAS BEEN ESTABLISHED OR OTHER SEDIMENT CONTROL STRUCTURES ARE IN PLACE. BACKFILL AND COMPACT ANCHOR TRENCH TO FINAL GRADE AS REQUIRED AFTER REMOVAL.

(G) IF NECESSARY, AT DIRECTION OF TDOT ENGINEER, SLIPCOVER MAY BE SECURED IN PLACE AT THE LOWEST PRACTICAL POINT WITH NYLON STRING, TWINE, WIRE OR OTHER SUITABLE MATERIAL.

(H) WHERE LARGE QUANTITIES OF SEDIMENT OR HIGH VELOCITIES OF APPROACHING WATER ARE ANTICIPATED DUE TO SPACING OF CATCH BASINS, DITCH GRADE, ETC...OTHER EROSION PREVENTION AND SEDIMENT CONTROL DEVICES MAY BE NECESSARY UPSTREAM OF FILTER ASSEMBLY.

(I) ALL LABOR AND MATERIALS NECESSARY TO CONSTRUCT AND INSTALL TEMPORARY CATCH BASIN FILTER ASSEMBLY INCLUDING TRENCHING, BACKFILLING, STONE, AND SLIPCOVER SHALL BE PAID FOR UNDER ITEM NUMBER 209-40.41, CATCH BASIN FILTER ASSEMBLY (TYPE 1), PER EACH.

INSTALLATION SEQUENCE FOR HARDWARE CLOTH

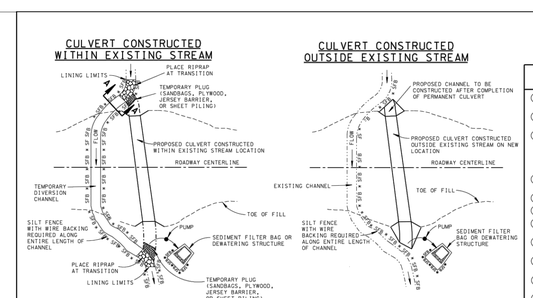
INSTALL TOP HARDWARE CLOTH A. PULL MATERIAL TIGHT, LAP AND STAPLE AS SHOWN. CUT TO LENGTH AND TRIM SHARP EDGES.

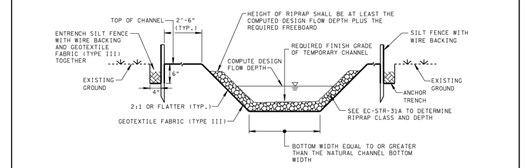
INSTALL TOP HARDWARE CLOTH B - OVERLAPPING CLOTH A. PULL CLOTH TIGHT, LAP, AND STAPLE AS SHOWN. CUT TO LENGTH AND TRIM ALL SHARP EDGES.

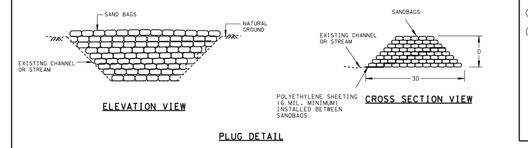
INSTALL HARDWARE CLOTH AROUND EXTERIOR OF WOOD FRAME USING ONE CONTINUOUS PIECE BEGINNING AT A CORNER, ENDING AT SAME CORNER, AND OVERLAPPING AS REQUIRED. PULL TIGHT AND STAPLE EACH SIDE BEFORE PROCEEDING WITH SUBSEQUENT SIDES.

TRIM EXCESS ALONG BOTTOM AS NECESSARY.

4.04 *AREA INLET PROTECTION*
NO SCALE







EROSION CONTROL PLAN LEGEND: TEMPORARY DIVERSION CHANNEL (DESCRIBE - SIZE AND TYPE OF LINING)

TEMPORARY DIVERSION CHANNELS GENERAL NOTES

(A) DIVERSION CHANNELS SHALL BE USED TO DIVERT NORMAL STREAM FLOW FROM AN ERODIBLE AREA IN ORDER TO PREVENT POLLUTION OF THE STREAM DUE TO EROSION.

(B) EXAMPLE SHOWN IS FOR NEW CULVERT CONSTRUCTION. OTHER PROJECTS WOULD BE CONSTRUCTED IN A SIMILAR MANNER.

(C) TEMPORARY DIVERSION CHANNELS SHALL BE DESIGNED USING A 2-YEAR, 24-HOUR STORM FREQUENCY FLOW RATE. STANDARD DRAWING EC-STR-31A, MAY BE USED AS A GUIDELINE FOR DETERMINING THE CHANNEL SIZE. FOR ANY SITE WHERE Q 10 EXCEEDS 500 CFS, THE DESIGN OF THIS MEASURE SHOULD BE COMPLETED BY THE HYDRAULICS SECTION OF THE STRUCTURES DIVISION. AT SITES WHICH INVOLVE EXCEPTIONAL TENNESSEE WATERS OR SEDIMENT-IMPAIRED STREAMS, THE STABILITY OF THE RIPRAP CHANNEL LINING SHOULD BE DESIGNED FOR THE 5-YEAR, 24-HOUR PEAK FLOW.

(D) ALL TEMPORARY DIVERSION CHANNELS SHALL HAVE A TRAPEZOIDAL SHAPE AND THE BOTTOM WIDTH SHALL BE EQUAL TO OR GREATER THAN THE NATURAL CHANNEL BOTTOM WIDTH.

(E) TO DETERMINE RIPRAP CLASS AND DEPTH USE STANDARD DRAWING EC-STR-31A.

(F) ONLY GEOTEXTILE FABRIC (TYPE III) LISTED ON THE QUALIFIED PRODUCTS LIST SHALL BE USED.

(G) GEOTEXTILE (TYPE III) (EROSION CONTROL) SHALL BE USED EITHER WITH OR WITHOUT RIPRAP, AS RECOMMENDED IN NOTE B6 ON STANDARD DRAWING EC-STR-31A.

(H) GEOTEXTILE FABRIC (TYPE III) SHALL BE USED ALONE ONLY IN CHANNELS WITH INTERMITTENT FLOW. USE A RIPRAP LINED CHANNEL OR CULVERT WHERE THE STREAM FLOWS YEAR-ROUND.

(I) WHERE EXCAVATION FOR A DIVERSION CHANNEL EXPOSES BEDROCK, GEOTEXTILE FABRIC AND RIPRAP SHALL BE REQUIRED ONLY ON THE SIDES OF THE CHANNEL.

(J) RIPRAP TRANSITIONS AT THE ENTRANCE AND EXIT OF THE DIVERSION CHANNEL SHALL BE DESIGNED IN ACCORDANCE WITH APPROVED TDOT METHODS.

(K) DURING CONSTRUCTION OF THE DIVERSION CHANNEL, DAMAGE TO THE EXISTING STREAM AND DAMAGE TO THE CANOPY SHALL BE MINIMIZED. ALL EXISTING VEGETATION OUTSIDE THE CUT AND FILL LINES BUT INSIDE THE RIGHT-OF-WAY SHALL NOT BE DISTURBED UNLESS IT INTERFERES WITH SAFETY STANDARDS.

(L) THE PROJECT SHALL BE PLANNED IN ORDER TO MINIMIZE THE LENGTH OF TIME THE DIVERSION WILL BE REQUIRED.

(M) DIVERSION CHANNEL CONSTRUCTION SHALL BE COMPLETED IN THE DRY BEFORE DIVERTING WATER FROM THE EXISTING CHANNEL. WHERE THIS IS NOT FEASIBLE, TEMPORARY FLOW DIVERSION STRUCTURES CAN BE USED UNTIL WORK IS COMPLETE. THESE STRUCTURES CAN BE ANY NON-ERODIBLE MATERIAL.

(N) CONSTRUCTION SHALL PROCEED AS FOLLOWS:

1. CONSTRUCT A MEANDERING TEMPORARY CHANNEL ADJACENT TO THE PROPOSED PROJECT. ISOLATE THE TEMPORARY CHANNEL FROM THE EXISTING CHANNEL WITH TEMPORARY PLUGS. TEMPORARY EROSION CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 209 OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.
2. THE DIVERSION CHANNEL SHALL BE STABILIZED AND INSPECTED BY THE PROJECT ENGINEER BEFORE FLOW IS DIVERTED. DIVERT FLOW BY MOVING THE TEMPORARY PLUGS FROM THE TEMPORARY CHANNEL TO THE EXISTING CHANNEL. A COFFER DAM MAY BE USED UPSTREAM TO PREVENT STREAM FLOW DURING THIS OPERATION.
3. CONSTRUCT THE PROJECT IN THE EXISTING STREAM AND PLACE PERMANENT EROSION CONTROL ON THE EXISTING STREAM BANKS.
4. WHERE A TEMPORARY PLUG IS REQUIRED AT THE DOWNSTREAM END OF THE DIVERSION, IT SHOULD BE REMOVED FIRST. THEN REMOVE THE UPPER PLUG IN ORDER TO RELEASE FLOW INTO THE RECONSTRUCTED CHANNEL.
5. REMOVE LINING MATERIALS FROM THE DIVERSION CHANNEL, RESTORE THE AREA TO GRADE, AND STABILIZE EXPOSED SOILS.

(O) ALTERNATIVE DIVERSION METHOD MAY INCLUDE PARALLEL JERSEY BARRIERS LINED WITH POLYETHYLENE SHEETING (6 MIL MINIMUM).

(P) DIVERSION CHANNEL SHALL BE INSPECTED WEEKLY OR AFTER EVERY RAIN EVENT. ANY NEEDED REPAIRS SHALL BE DONE IMMEDIATELY.

(Q) FOR INSTALLATION DETAILS AND ITEM NUMBERS FOR DEWATERING STRUCTURES (EC-STR-1), SEDIMENT FILTER BAGS (EC-STR-2), AND SILT FENCE WITH WIRE BACKING (EC-STR-3C) SEE THEIR RESPECTIVE STANDARD DRAWINGS.

☐ MINOR REVISION — FHWA APPROVAL NOT REQUIRED

NOT TO SCALE

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

TEMPORARY
DIVERSION
CHANNEL

10-26-92 EC-STR-31

COMMUNITY DEVELOPMENT ENTERPRISES
SITE PLAN
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

REVISIONS

THIS DRAWING SHALL BE CONSIDERED PRELIMINARY IN NATURE AND, IN NO WAY, FINAL OR COMPLETE, UNLESS THE SEAL OF THE ENGINEER OR SURVEYOR OF RECORD IS AFFIXED HERETO.

SHEET: SITE DETAILS

NUMBER: C-903

L.I. Smith and Associates, Inc.
LAND DEVELOPMENT | INFRASTRUCTURE DESIGN
— SURVEYING SERVICES —
302 North Caldwell Street, Paris, TN 38242 ; 731-644-1014 ; www.lismith.com
475 Metroplex Drive, Suite 212 Nashville, TN 37211 ; 615-256-0290

DRAWN BY: NTG | CHECKED BY: WPS | SCALE: | DATE: 01/15/2021

PROJECT # 201044

NRI000054

SITE DEVELOPER:

COMMUNITY DEVELOPMENT ENTERPRISES
1104 WHITEHALL STREET
JACKSON, TN 38301
PHONE: 731-240-5001
CONTACT: DENNIS EMBERLING

BUILDING & CODES:

CITY OF JACKSON
BUILDING & CODES DEPARTMENT
119 EAST MAIN STREET, SUITE 208
JACKSON, TN 38301
PHONE: 731-425-8255
CONTACT: GREG ROWLAND

CIVIL ENGINEER:

L.I. SMITH AND ASSOCIATES
302 N. CALDWELL STREET
PARIS, TN 38242
PHONE: 731-644-1014
CONTACT: PATRICK SMITH

FIRE DEPARTMENT:

CITY OF JACKSON FIRE DEPARTMENT
720 SOUTH HIGHLAND AVENUE
JACKSON, TN 38301
PHONE: 731-425-8350
CONTACT: CHIEF DARRYL SAMUELS

LAND SURVEYOR:

L.I. SMITH AND ASSOCIATES
302 N. CALDWELL STREET
PARIS, TN 38242
PHONE: 731-644-1014
CONTACT: PATRICK SMITH

SANITARY SEWER DEPT.

JACKSON ENERGY AUTHORITY
351 MARTIN LUTHER KING JR. DRIVE
JACKSON, TN 38301
PHONE: 731-422-7371

TELEPHONE:

AT&T
208 SOUTH AKARD STREET
DALLAS, TX 75202
PHONE: 800-288-2020

WATER DEPT.

JACKSON ENERGY AUTHORITY
351 MARTIN LUTHER KING JR. DRIVE
JACKSON, TN 38301
PHONE: 731-422-7371

ELECTRIC:

JACKSON ENERGY AUTHORITY
351 MARTIN LUTHER KING JR. DRIVE
JACKSON, TN 38301
PHONE: 731-422-7371

NATURAL GAS:

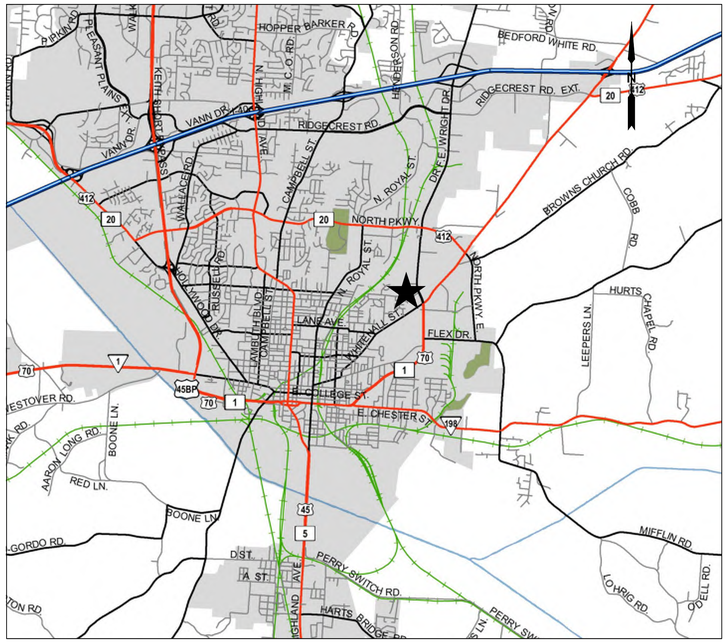
JACKSON ENERGY AUTHORITY
351 MARTIN LUTHER KING JR. DRIVE
JACKSON, TN 38301
PHONE: 731-422-7371

TENNESSEE ONE CALL SYSTEM, INC. 1-800-351-1111 STOP-CALL BEFORE YOU DIG!

NOTICE OF COVERAGE HAS BEEN ISSUED FOR A GENERAL CONSTRUCTION PERMIT AND ASSOCIATED GENERAL ARAP PERMIT THROUGH TDEC.

PERMITTED DISTURBANCE: 32 ACRES
TDEC PERMIT NUMBERS:
TNR 122460
NR 2102.014

COMMUNITY DEVELOPMENT ENTERPRISES
JACKSON SOLAR MICROGRID
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE



VICINITY MAP - NOT TO SCALE

SITE DATA

A. OWNERS OF RECORD: HUNT PROPERTIES, 1031 GREYSTONE SQUARE, JACKSON, TN 38305; MORRIS CROCKER, 15 SUTTON PLACE, JACKSON, TN 38305

DEVELOPER: COMMUNITY DEVELOPMENT ENTERPRISES, 1104 WHITEHALL STREET, JACKSON, TN 38301

B. SOURCE OF TITLE: BOOK 733, PAGE 731 AND BOOK 257, PAGE 455
TAX MAP 65, PARCEL 103.00 AND 104.00

CITY OF JACKSON, MADISON COUNTY, TENNESSEE

SITE AREA = +/- 32 ACRES
TOTAL AREA = +/- 34.27 ACRES

C. THE SITE IS LOCATED IN UNSHADED FLOOD ZONE "X", AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS DETERMINED BY THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP NO. 471130168E, DATED AUGUST 03, 2009.

PLANNING INFORMATION

A. ZONING DESIGNATION: GENERAL RESIDENTIAL DISTRICT
FRONT SETBACK: 25 FEET
SIDE SETBACK: 8 FEET
REAR SETBACK: 10 FEET

B. INTENDEND USE: SOLAR MICROGRID

C. PARKING: NONE REQUIRED FOR INTENDED USE
REQUIRED 0 SPACES
PROPOSED 0 SPACES

SHEET NO.	SHEET NAME	SCALE
C-000	COVER SHEET	
C-001	NOTES	
C-100	EXISTING	1"=100'
C-101	VEGETATIVE IMPACT EVAL.	1"=100'
C-200	LAYOUT	1"=100'
C-201	LANDSCAPING	1"=100'
C-300	GRADING	1"=100'
C-400	E.P.S.C. PHASE 1	1"=100'
C-401	E.P.S.C. PHASE 2	1"=100'
C-402	E.P.S.C. PHASE 3	1"=100'
C-403	A.R.A.P.	1"= 30'
C-404	E.P.S.C. PHASE 4	1"=100'
C-900	DETAILS	
C-901	DETAILS	
C-902	DETAILS	
C-903	DETAILS	
C-904	DETAILS	

Ownership and Quality of Construction

CERTIFICATE OF QUALITY OF CONSTRUCTION

I hereby certify that I will construct the improvements shown hereon and guarantee that they meet the requirements and specifications set forth in the Subdivision and Land Development Regulations and subject to the review and approval of the Jackson Municipal Regional Planning Commission and Subdivision Review Agencies.

Date _____ Owner/Developer _____

Engineering Certification

CERTIFICATE OF ACCURACY OF DESIGN

I hereby certify that I am a registered engineer, licensed to practice engineering under the laws of the State of Tennessee. I further certify that the plan and accompanying drawings, documents, and statements conform to the standards of good engineering practice, and to all applicable provisions of the Subdivision and Land Development Regulations, except as has been itemized and described in a report files with the Jackson Municipal Regional Planning Commission, if applicable.

Date _____ Registered Engineer
Tennessee Certificate No. _____

Public Water Systems

CERTIFICATE OF APPROVAL OF WATER SYSTEMS

I hereby concur that the water utility plans depicted within these construction drawings meet the minimum requirements of the Jackson Energy Authority and are hereby recommended for approval for construction as shown herein.

Date _____ Jackson Energy Authority _____

Sanitary Sewerage Systems

CERTIFICATE OF APPROVAL OF SANITARY SEWERAGE SYSTEMS

I hereby concur that the sanitary sewerage utility plans depicted within these construction drawings meet the minimum requirements of the Jackson Energy Authority and are hereby recommended for approval for construction as shown herein.

Date _____ Jackson Energy Authority _____

Streets and Storm Drainage

CERTIFICATE OF APPROVAL OF STREETS AND STORM DRAINAGE

I hereby concur that the street construction and storm drainage plans depicted within these construction drawings meet the minimum requirements of the City of Jackson and are hereby recommended for approval for construction as shown herein.

Date _____ City of Jackson Engineering Department _____

Construction Drawing Approval

CERTIFICATE OF CONSTRUCTION DRAWING APPROVAL

I hereby certify that these construction drawings have been reviewed by all applicable review agencies and has been approved by the Jackson Municipal Regional Planning Commission and therefore are hereby approved for construction as shown herein.

Date _____ Jackson Municipal Regional Planning Commission _____

L.I. Smith and Associates, Inc.
LAND DEVELOPMENT | INFRASTRUCTURE DESIGN
SURVEYING SERVICES
302 North Caldwell Street, Paris, TN 38242 ı 731-644-1014 ı www.lismith.com
475 Metroplex Drive, Suite 212 Nashville, TN 37211 ı 615-256-0290

William P. J. Smith
REGISTERED ENGINEER
AGRICULTURE
No. 109351
STATE OF TENNESSEE

SHEET: COVER
NUMBER: C-000

REVISIONS

NRI000055

CITY OF JACKSON ENGINEERING DEPARTMENT:

GENERAL CONSTRUCTION NOTES:

1. THE CONTRACTOR SHALL NOTIFY THE CITY OF JACKSON BEFORE COMMENCING CONSTRUCTION.

2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING ANY UTILITY COMPANY, WHICH MAINTAINS A UTILITY LINE WITHIN THE BOUNDARIES OF THE PROJECT BEFORE THE INITIATION OF ANY CONSTRUCTION ON THE PROJECT OR IN THE STREETS BORDERING THE PROJECT.

3. BEFORE ANY GRADING IS STARTED, THE DEVELOPER/CONTRACTOR MUST OBTAIN A DEVELOPMENT PERMIT FROM THE CITY OF JACKSON.

4. ALL CONSTRUCTION SHALL MEET THE CITY OF JACKSON STANDARD SPECIFICATIONS CONTAINED WITHIN THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS.

5. THE CONTRACTOR MUST HAVE WRITTEN APPROVAL FROM THE CITY OF JACKSON ENGINEER AND THE PROJECT ENGINEER BEFORE ANY CHANGE IN DESIGN IS MADE.

6. ALL CONSTRUCTION SHALL BE TESTED BY A LICENSED INDEPENDENT MATERIAL TESTING COMPANY TO ENSURE COMPLIANCE WITH COMPACTION REQUIREMENTS AND TO ENSURE THE MINIMUM THICKNESS OF BASE AND PAVEMENT. A COPY OF THE TEST RESULTS SHALL BE FORWARDED TO THE CITY OF JACKSON AND LABELED AS TEST REPORTS, "SUBDIVISION NAME", JACKSON, TENNESSEE.

7. ALL SOIL FILL AREAS IN THE STREET SHALL BE COMPACTED TO 95% OF STANDARD PROCTOR DENSITY, TESTED PER ASTM D-698. THE TOP SIX INCHES OF ALL FILLS AND CUT AREAS IN THE STREET SHALL BE COMPACTED TO 100% OF STANDARD PROCTOR DENSITY PER ASTM D-698.

8. FILLS SHALL BE CONSTRUCTED IN LIFTS WITH A MAXIMUM LOOSE LIFT THICKNESS OF EIGHT (8) INCHES.

9. SUBGRADE COMPACTION TESTING MUST BE COMPLETED AFTER INSTALLATION OF ALL UTILITIES IN THE STREET AND IMMEDIATELY PRECEDING BASE MATERIAL APPLICATION. THE SUBGRADE COMPACTION TEST RESULTS MUST BE SUBMITTED TO AND APPROVED BY THE CITY ENGINEER'S OFFICE PRIOR TO THE APPLICATION OF THE BASE MATERIAL. BASE MATERIAL COMPACTION TESTING MUST BE COMPLETED IMMEDIATELY PRECEDING THE APPLICATION OF THE BINDER COAT. THE BASE MATERIAL TEST RESULTS MUST BE SUBMITTED TO AND APPROVED BY THE CITY ENGINEER'S OFFICE PRIOR TO THE APPLICATION OF THE BINDER COAT. THE BINDER COAT COMPACTION AND THICKNESS TEST RESULTS MUST BE SUBMITTED TO AND APPROVED BY THE CITY ENGINEER'S OFFICE PRIOR TO THE APPROVAL OF THE FINAL PLAT. ALL STORM DRAIN AND OTHER UTILITIES LOCATED UNDER THE STREETS SHALL HAVE TRENCHES COMPACTED AT 95% STANDARD PROCTOR DENSITY PER ASTM D-698.

10. THE MINIMUM FREQUENCY OF SOIL TESTS SHALL BE ONE TEST PER 300 FEET OF STREET LENGTH WITH A MINIMUM OF THREE (3) TESTS PER PROJECT PHASE. TESTING SHALL BE PERFORMED AT THE ABOVE FREQUENCY ON EACH TEN (10) INCH LIFT OF FILLS AND ON THE FINAL SUBGRADE WHETHER IN CUT OR FILL.

11. PRIOR TO PLACING GRANULAR BASE ON THE STREET THE SUBGRADE SHALL BE PROOF ROLLED WITH A LOADED DUMP TRUCK WITH A GROSS WEIGHT OF APPROXIMATELY 30 TONS IN THE PRESENCE OF THE CITY

ENGINEER OR HIS DESIGNEE. NOTIFY THE CITY ENGINEER A MINIMUM OF TWO WORKING DAYS IN ADVANCE FOR SCHEDULING.

12. ROADWAY BASE SHALL BE COMPACTED TO A MINIMUM DENSITY OF 95% STANDARD PROCTOR DENSITY (ASTM D-698).

13. THE GRANULAR BASE SHALL BE TESTED FOR DENSITY AND THICKNESS EVERY 300 FEET OF STREET LENGTH WITH A MINIMUM OF THREE (3) TESTS PER PROJECT PHASE.

14. PRIOR TO PLACING ASPHALT ON THE STREET THE GRANULAR BASE SHALL BE PROOF ROLLED WITH A LOADED DUMP TRUCK WITH A GROSS WEIGHT OF APPROXIMATELY 30 TONS IN THE PRESENCE OF THE CITY ENGINEER OR HIS DESIGNEE. NOTIFY THE CITY ENGINEER A MINIMUM OF TWO WORKING DAYS IN ADVANCE FOR SCHEDULING.

15. ALL ASPHALTIC COURSES SHALL BE COMPACTED TO A MINIMUM OF 92% OF MAXIMUM THEORETICAL DENSITY.

16. ASPHALT SHALL BE RANDOMLY TESTED FOR DENSITY AND THICKNESS EVERY 300 FEET OF STREET LENGTH WITH A MINIMUM OF THREE (3) TESTS PER PROJECT PHASE.

17. CONCRETE FOR CURB AND GUTTER AND SIDEWALK SHALL BE A MINIMUM 3000 PSI AT 28 DAYS AND SHALL BE TESTED FOR CONSISTENCY AND STRENGTH IN ACCORDANCE WITH AASHTO TEST METHODS T 119, T 22 AND T 23. THE TESTS SHALL BE PERFORMED EVERY 800 FEET OF STREET LENGTH WITH A MINIMUM OF ONE (1) TEST PER DAY.

18. TYPE, USE AND LOCATION OR ORNAMENTAL STREET SIGNS AND SIGNPOSTS MUST BE APPROVED BY THE CITY OF JACKSON ENGINEERING DEPARTMENT PRIOR TO SUBMISSION OF THE FINAL PLAT.

19. ADJUST MANHOLE LIDS TO MATCH GRADE OF CROSS-SLOPE IF OFFSET FROM CENTERLINE. ALL MANHOLE LIDS TO BE FLUSH WITH BASE LAYER OF PAVEMENT THEN ADJUSTED AS REQUIRED BY CONTRACTOR WITH FINAL PAVEMENT LAYER INSTALLATION.

20. ALL STREETS ADJACENT TO THE SITE SHALL BE KEPT CLEAN DURING CONSTRUCTION.

21. TRAFFIC CONTROL SHALL BE PROVIDED AS APPROPRIATE AND SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

GRADING & DRAINAGE NOTES:

1. CONTRACTOR SHALL VERIFY EXISTING ELEVATIONS PRIOR TO BEGINNING WORK.

2. CONTOUR LINES AND SPOT ELEVATIONS ARE THE RESULT OF A DETAILED ENGINEERING GRADING DESIGN AND REFLECT A PLANNED INTENT WITH REGARD TO DRAINAGE AND MOVEMENT OF MATERIALS. SHOULD THE CONTRACTOR HAVE ANY QUESTION OF THE INTENT OR ANY PROBLEMS WITH CONTINUITY OF GRADES, THE ENGINEER SHOULD BE CONTACTED IMMEDIATELY PRIOR TO BEGINNING WORK.

3. CONTRACTOR SHALL REFER TO AND ADHERE TO THE RECOMMENDATIONS IN THE GEOTECHNICAL ENGINEERING REPORT, IF AVAILABLE.

4. ALL TRENCHING, PIPE LAYING, AND BACKFILLING SHALL BE IN ACCORDANCE WITH FEDERAL OSHA REGULATIONS.

5. ANY RETAINING WALLS REQUIRED SHALL BE BY DESIGN/BUILD AND MUST BE DESIGNED AND SEALED BY AN ENGINEER LICENSED IN THE STATE OF TENNESSEE AND SUBMITTED FOR REVIEW AND APPROVAL PRIOR TO ISSUANCE OF A PERMIT. REFER TO THE VENDOR'S PLANS FOR RETAINING WALL AND RAILING DETAILS. GUARDS (42" HIGH) SHALL BE PROVIDED FOR ALL RETAINING WALLS WHERE DROPS ARE EQUAL TO OR EXCEED 30 INCHES IN HEIGHT, IN ACCORDANCE WITH APPLICABLE CODES.

EROSION CONTROL NOTES:

1. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN EROSION CONTROL DURING CONSTRUCTION AS REQUIRED BY THE CITY OF JACKSON RULES AND REGULATIONS FOR CONTROL OF EROSION AND STORMWATER AND THE LATEST EDITION OF THE TENNESSEE EROSION AND SEDIMENT CONTROL HANDBOOK TO PREVENT SITUATION DOWNSTREAM IN ANY DITCHES, PIPES, DRAINAGE STRUCTURES, STREETS, OR ADJACENT PROPERTIES.

2. ADDITIONAL EROSION CONTROL MEASURES MAY BE NECESSARY AS WORK PROGRESSES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING AND ADJUSTING THE EROSION CONTROL MEASURES AS NECESSARY THROUGHOUT THE LIFE OF CONSTRUCTION AND UNTIL FULL STABILIZATION OF THE AREA IS ACHIEVED.

3. ALL TEMPORARY EROSION CONTROL MEASURES MUST BE IN PLACE BEFORE BEGINNING EARTH-MOVING OPERATIONS. AREAS OF EXPOSED EARTH SHALL BE KEPT TO A MINIMUM. EMBANKMENTS AND EXCAVATED AREAS SHALL BE PROMPTLY STABILIZED TO MINIMIZE EROSION.

4. THE CONTRACTOR OR OWNER SHALL FILE ALL DOCUMENTS NECESSARY FOR RECEIVING A NPDES PERMIT WHEN REQUIRED FOR STORMWATER DISCHARGE (FILING THE N.O.I., INCLUDING PAYMENT OF PERMIT FEES) IMPLEMENT AN EFFECTIVE EROSION PLAN, DOCUMENT THE EFFECTIVENESS OF THE PLAN AND ADJUST THE PLAN AS NECESSARY TO COMPLY WITH THE CONDITIONS OF THE PERMIT. THIS PLAN SHALL BE REVISED AS NECESSARY AND SHALL BE MADE A PART OF THE STORMWATER POLLUTION PREVENTION PLAN. ALL PROPOSED REVISIONS SHALL BE IN CONSULTATION WITH THE DESIGN ENGINEER.

5. ALL EXCAVATION AND FILL ACTIVITIES MUST BE CONDUCTED IN THE DRY.

6. CHECK DAMS SHALL BE INSTALLED IN THE TOE OF ALL FILL SLOPES, IN DITCHES, AND OTHER AREAS AS NECESSARY TO PREVENT SILTS FROM ENTERING ADJACENT PROPERTIES. ALL BALED STRAW SHALL BE REPLACED AT 60-DAY MINIMUM INTERVALS, UNTIL FULL STABILIZATION IS ACHIEVED.

7. ANY STOCKPILED SOILS FOR FILL MATERIAL, SHALL BE LOCATED AND TREATED IN A MANNER TO PREVENT SILT FROM LEAVING THE PROPERTY EITHER THROUGH STORM DRAINS OR OVER LAND.

8. CONTRACTOR SHALL MAINTAIN A RAIN GAGE ON SITE AT ALL TIMES AND RECORD RAINFALL DAILY. CONTRACTOR MUST INSPECT EROSION CONTROL TWICE PER CALENDAR WEEK. INSPECTIONS MUST TAKE PLACE AT LEAST 72 HOURS APART.

9. ALL AREAS SHALL BE SEEDED AND MULCHED AT MINIMUM. STABILIZING MATERIALS SHALL BE APPLIED AS SOON AS POSSIBLE UPON COMPLETION OF FINAL GRADING AND IN NO CASE GREATER THAN 15 DAYS.

10. AFTER FULL STABILIZATION OF ALL DISTURBED AREAS THE CONTRACTOR SHALL REMOVE ALL TEMPORARY EROSION CONTROL ITEMS. AFTER FULL STABILIZATION THE CONTRACTOR SHALL FILE A "NOTICE OF TERMINATION" WITH THE STATE OF TENNESSEE.

11. WHERE EARTH-DISTURBING ACTIVITY HAS BEEN TEMPORARILY CEASED, TEMPORARY STABILIZATION WILL BE APPLIED WITHIN (7) SEVEN DAYS IF THE ACTIVITY WILL NOT RESUME WITHIN (15) FIFTEEN DAYS.

12. THE DEVELOPER OR ANY DESIGNEE PERFORMING CONSTRUCTION ACTIVITIES ON HIS BEHALF IS RESPONSIBLE FOR COMPLYING WITH APPLICABLE STATE AND FEDERAL REGULATIONS WITH REGARD TO SEDIMENT/EROSION CONTROL.

COMMUNITY DEVELOPMENT ENTERPRISES
JACKSON SOLAR MICROGRID
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

REVISIONS

THIS DRAWING SHALL BE CONSIDERED PRELIMINARY IN NATURE AND, IN NO WAY, FINAL OR COMPLETE, UNLESS THE SEAL OF THE ENGINEER OR SURVEYOR OF RECORD IS AFFIXED HEREON.

SHEET: NOTES

NUMBER: C-001

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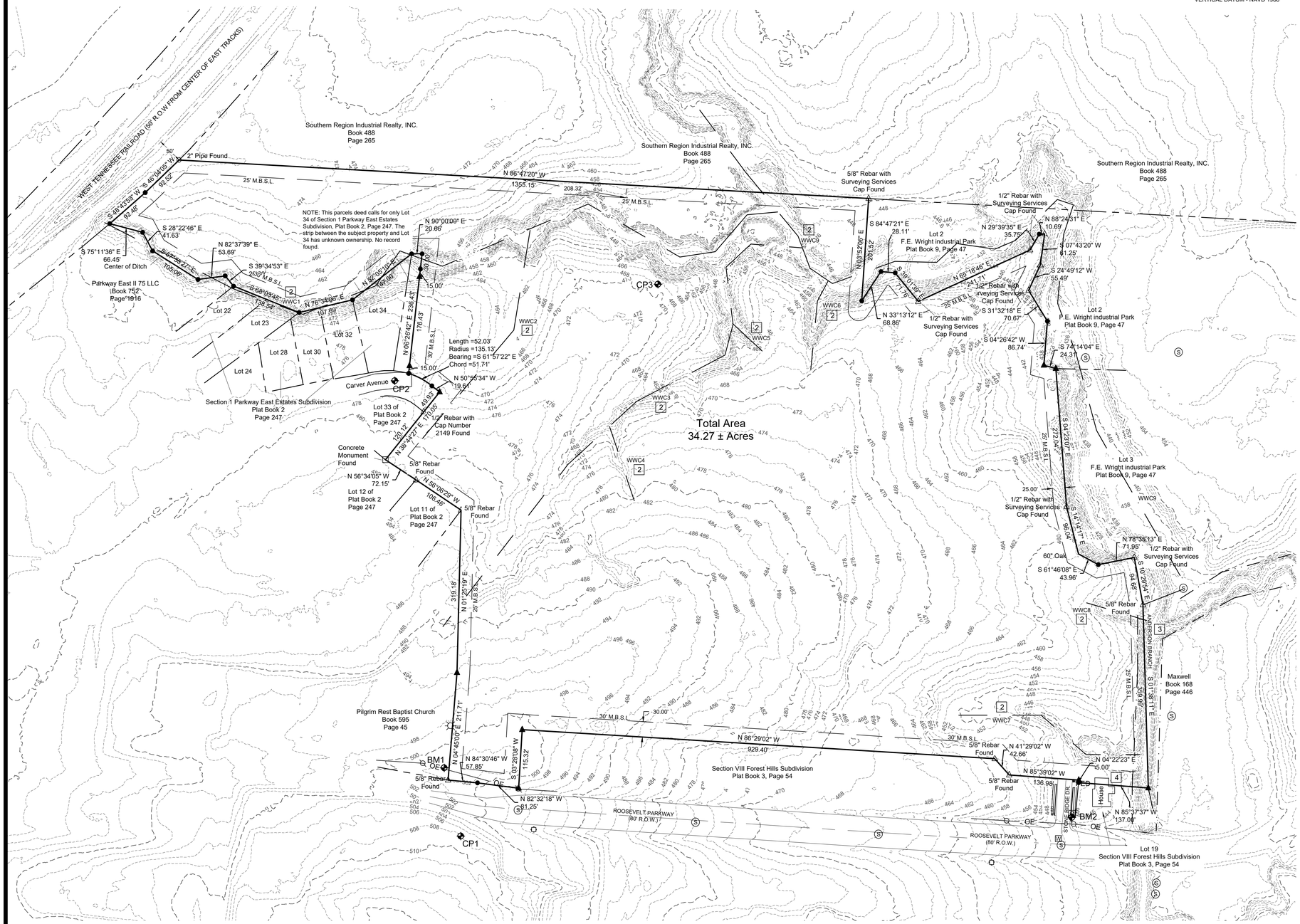
475 Metroplex Drive, Suite 212 Nashville, TN 37211 | 615-256-0290

DRAWN BY: NTG | CHECKED BY: WPS | SCALE:
PROJECT # 200288 | DATE:

COMMUNITY DEVELOPMENT ENTERPRISES
JACKSON SOLAR MICROGRID
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE



SITE DATA

A. OWNERS OF RECORD: HUNT PROPERTIES, 1031 GREYSTONE SQUARE, JACKSON, TN 38305; MORRIS CROCKER, 15 SUTTON PLACE, JACKSON, TN 38305

DEVELOPER: COMMUNITY DEVELOPMENT ENTERPRISES, 1104 WHITEHALL STREET, JACKSON, TN 38301

B. SOURCE OF TITLE: BOOK 733, PAGE 731 AND BOOK 257, PAGE 455
TAX MAP 65, PARCEL 103.00 AND 104.00

CITY OF JACKSON, MADISON COUNTY, TENNESSEE

SITE AREA = +/- 32 ACRES
TOTAL AREA = +/- 34.27 ACRES

C. THE SITE IS LOCATED IN UNSHADED FLOOD ZONE "X", AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS DETERMINED BY THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP NO. 47113O168E, DATED AUGUST 03, 2009.

SURVEYOR NOTES:

INFORMATION REGARDING THE PRESENCE, SIZE AND LOCATION OF UNDERGROUND UTILITIES IS SHOWN HEREON. THIS INFORMATION HAS BEEN SHOWN BASED ON THE LOCATION OF ABOVE GROUND APPURTENANCES, AVAILABLE DESIGN PLANS, AND FLAGS AND PAINT PLACED BY THE UNDERGROUND PROTECTION SERVICE. NO CERTIFICATION IS MADE AS TO THE ACCURACY OF THOROUGHNESS OF THE INFORMATION CONCERNING UNDERGROUND UTILITIES AND STRUCTURES SHOWN HEREON. (TENNESSEE ONE CALL SYSTEM, INC. 1-800-351-1111).

CONTACT PROPER AUTHORITIES BEFORE BUILDING NEAR UTILITY LINES, FOR EASEMENT WIDTH AND RESTRICTIONS. UTILITIES ARE APPROXIMATE AND SHOULD BE VERIFIED PRIOR TO ANY CONSTRUCTION.

THIS SURVEY HAS BEEN PREPARED FOR THE EXCLUSIVE USE OF THE PERSON ENTITIES NAMED HERON. NO EXPRESS OR IMPLIED WARRANTIES WITH RESPECT TO THE INFORMATION SHOWN HEREON IS TO BE EXTENDED TO ANY PERSONS OR ENTITIES OTHER THAN THOSE SHOWN HEREON.

THIS PROPERTY IS SUBJECT TO ALL EASEMENTS, RIGHTS OF WAY, RESTRICTIONS AND CONVEYANCES OF RECORD OR IN EXISTENCE. A TITLE COMMITMENT WAS NOT PROVIDED TO THE SURVEYOR.

THE SURVEY SHOWN HEREON WAS MADE IN ACCORDANCE WITH CHAPTER 0820-3, STANDARDS OF PRACTICE AS ADOPTED BY THE TENNESSEE STATE BOARD OF EXAMINERS FOR LAND SURVEYORS.

EXISTING CONDITIONS NOTES:

1. EXISTING SITE IS MOSTLY WOODED AND SLOPES FROM THE SOUTHWEST TO THE NORTHEAST AT A 5-8% SLOPE.
2. (9) EXISTING WET WEATHER CONVEYANCES (WWC) HAVE BEEN IDENTIFIED BY A HYDROLOGIC DETERMINATION PERFORMED BY CHRIS GROW OF GROW ENVIRONMENTAL DATED JANUARY 05, 2021.
3. AN EXISTING STREAM, ANDERSON BRANCH, RUNS ALONG THE PROPERTY LINE AT THE SOUTHEAST CORNER OF THE SITE.
4. AN EXISTING ADJOINER HOUSE, LOT 19 FOREST HILLS SUBDIVISION, APPEARS TO ENCROACH ONTO THE SITE.
5. EXCESS TOPSOIL AND TREE STUMPS WILL BE REMOVED OFFSITE.

CONTROL				
ID	NORTHING	EASTING	ELEVATION	DESCRIPTION
CP1	485434.437	1138186.576	507.00	NAIL SET
CP2	486328.707	1138057.117	477.46	NAIL SET
CP3	486517.922	1138573.650	468.05	NAIL SET
BM1	485568.348	1138154.225	502.26	REBAR SET
BM2	485474.214	1139385.985	445.28	REBAR SET
COORDINATE SYSTEM - NAD 1983				
VERTICAL DATUM - NAVD 1988				

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

REVISIONS

THIS DRAWING SHALL BE CONSIDERED PRELIMINARY IN NATURE AND, IN NO WAY, FINAL OR COMPLETE, UNLESS THE SEAL OF THE ENGINEER OR SURVEYOR OF RECORD IS AFFIXED HEREON.

SHEET: EXISTING
NUMBER: C-100

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DRAWN BY: NTG | CHECKED BY: WPS | SCALE: 1"=100'
PROJECT # 201044 | DATE: 01/15/2021

NRI000057

TREE #	SPECIES	DIAM. (in)
330	BLACK CHERRY	12
331	ELM	10
332	BLACK CHERRY	14
333	OAK	12
334	BLACK CHERRY	8
335	ASH	15
336	OAK	40
341	ASH	10
342	MAPLE	15
343	ASH	16
344	BLACK CHERRY	8
345	BLACK CHERRY	8
346	BLACK CHERRY	15
347	BLACK CHERRY	10
348	BLACK CHERRY	15
350	CEDAR	6
351	HICKORY	12
352	ASH	12
354	BLACK CHERRY	10
356	BLACK CHERRY	10
358	ASH	10
359	ASH	14
360	BLACK CHERRY	14
361	ASH	26
362	BLACK CHERRY	18
364	OAK	9
365	ASH	10
366	ASH	10
367	BLACK CHERRY	8
368	ELM	10
369	ASH	10
371	CHERRY	15
372	HICK	10
373	OAK	24
374	OAK	10
375	OAK	32
376	BLACK CHERRY	10
377	ASH	18
379	POPLAR	26
380	CEDAR	8
381	ELM	8
382	BLACK CHERRY	12
383	ASH	12
384	ASH	12
387	BLACK CHERRY	24
388	ASH	20
389	ASH	8
390	ASH	12
391	BLACK CHERRY	12
392	OAK	24
395	BLACK CHERRY	14
396	CEDAR	14
397	HICKORY	16
398	CEDAR	8
399	ASH	18

V-2 REQUIRED TREE REMOVAL, TOTAL AREA: 4.08 AC, SAMPLE AREA: 0.23 AC

SPECIES	BDH 6"	12"	18"	24"	30"	>30"	BDH SAMPLE TOTAL (in)	MULTIPLIER (TOTAL AREA/SAMPLE AREA)	AREA TOTAL BDH REMOVAL
CHERRY	1						6	17.77	107
CEDAR		2					24	17.77	427
ELM		1	1				30	17.77	533
MAPLE		1	1				30	17.77	533
OAK							0	17.77	0
POPLAR		2	3				78	17.77	1386
SWEETGUM							0	17.77	0
PINE		4	2		4		204	17.77	3626

V-3 REQUIRED TREE REMOVAL, TOTAL AREA: 6.21 AC, SAMPLE AREA: 0.10 AC

SPECIES	BDH 6"	12"	18"	24"	30"	>30"	BDH SAMPLE TOTAL (in)	MULTIPLIER (TOTAL AREA/SAMPLE AREA)	BDH AREA TOTAL (in)
CHERRY							0	62.10	0
CEDAR							0	62.10	0
ELM							0	62.10	0
MAPLE							0	62.10	0
OAK							0	62.10	0
POPLAR							0	62.10	0
SWEETGUM							0	62.10	0
PINE		8	1	1			138	62.10	8570

V-4 REQUIRED TREE REMOVAL, TOTAL AREA: 3.99 AC, SAMPLE AREA: 0.10 AC

SPECIES	BDH 6"	12"	18"	24"	30"	>30"	BDH SAMPLE TOTAL (in)	MULTIPLIER (TOTAL AREA/SAMPLE AREA)	BDH AREA TOTAL (in)
CHERRY							0	39.90	0
CEDAR							0	39.90	0
ELM							0	39.90	0
MAPLE							0	39.90	0
OAK							0	39.90	0
POPLAR							0	39.90	0
SWEETGUM							0	39.90	0
PINE		8	1	1			138	39.90	5506

VIE TOTAL TREE REMOVAL

SPECIES	BDH REMOVAL (in)
CHERRY	213
CEDAR	853
ELM	3150
MAPLE	4297
OAK	3602
POPLAR	12857
SWEETGUM	213
PINE	22403
TOTAL	**47588**

V-5 REQUIRED TREE REMOVAL, TOTAL AREA: 2.32 AC, SAMPLE AREA: 0.10 AC

SPECIES	BDH 6"	12"	18"	24"	30"	>30"	BDH SAMPLE TOTAL (in)	MULTIPLIER (TOTAL AREA/SAMPLE AREA)	BDH AREA TOTAL (in)
CHERRY							0	23.20	0
CEDAR							0	23.20	0
ELM		3					36	23.20	835
MAPLE		6					72	23.20	1670
OAK							0	23.20	0
POPLAR		6					72	23.20	1670
SWEETGUM							0	23.20	0
PINE							0	23.20	0

V-6 REQUIRED TREE REMOVAL, TOTAL AREA: 2.86 AC, SAMPLE AREA: 0.10 AC

SPECIES	BDH 6"	12"	18"	24"	30"	>30"	BDH SAMPLE TOTAL (in)	MULTIPLIER (TOTAL AREA/SAMPLE AREA)	BDH AREA TOTAL (in)
CHERRY							0	28.60	0
CEDAR							0	28.60	0
ELM							0	28.60	0
MAPLE							0	28.60	0
OAK		3					36	28.60	1030
POPLAR		5					60	28.60	1716
SWEETGUM							0	28.60	0
PINE		2	2				60	28.60	1716

V-7 REQUIRED TREE REMOVAL, TOTAL AREA: 2.60 AC, SAMPLE AREA: 0.10 AC

SPECIES	BDH 6"	12"	18"	24"	30"	>30"	BDH SAMPLE TOTAL (in)	MULTIPLIER (TOTAL AREA/SAMPLE AREA)	BDH AREA TOTAL (in)
CHERRY							0	26.00	0
CEDAR							0	26.00	0
ELM		4					48	26.00	1248
MAPLE		5					60	26.00	1560
OAK							0	26.00	0
POPLAR		6					72	26.00	1872
SWEETGUM							0	26.00	0
PINE							0	26.00	0

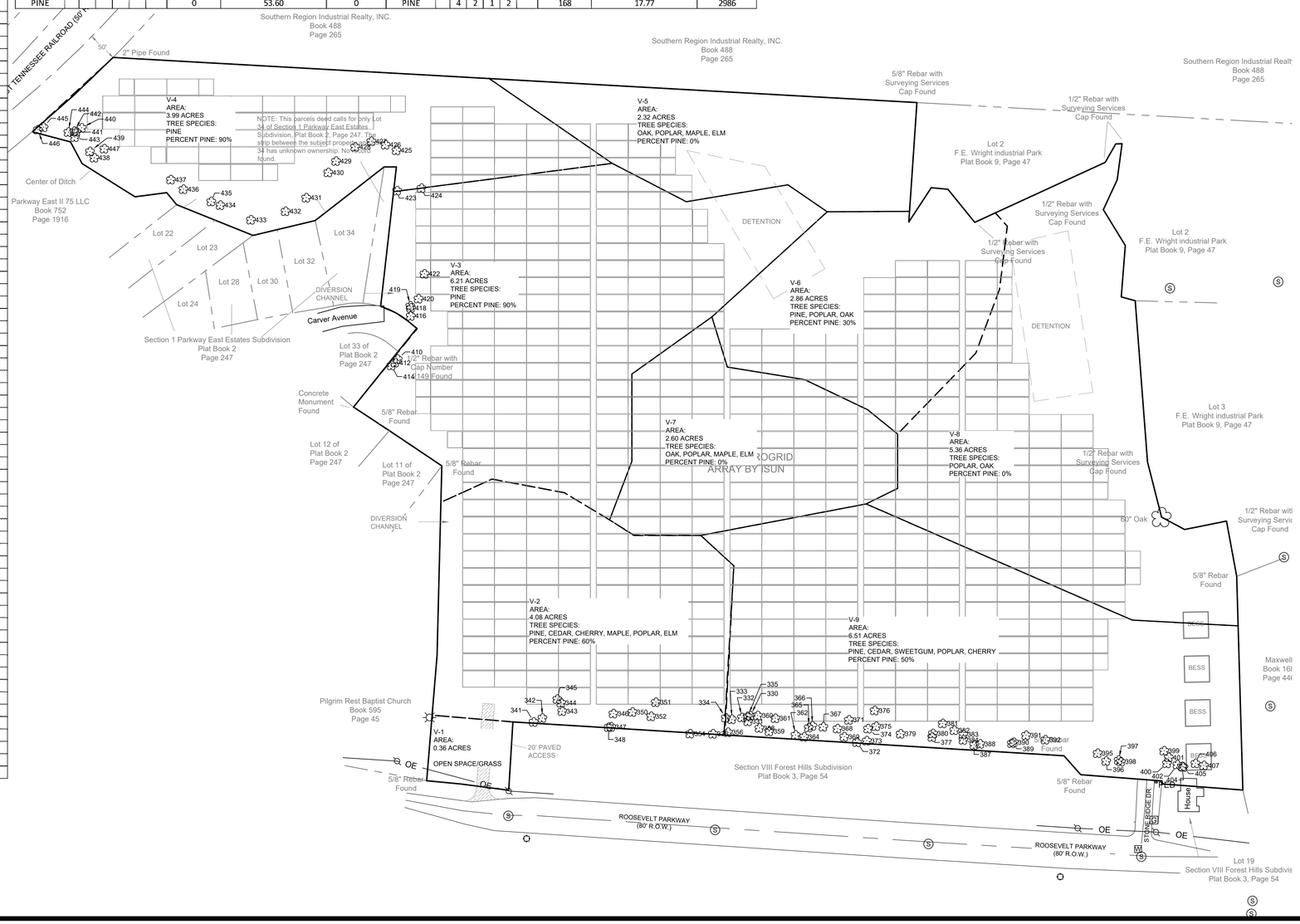
AREA ID	AREA (AC)
V-1	0.36
V-2	4.08
V-3	6.21
V-4	3.99
V-5	2.32
V-6	2.86
V-7	2.60
V-8	5.36
V-9	6.51

V-8 REQUIRED TREE REMOVAL, TOTAL AREA: 5.36 AC, SAMPLE AREA: 0.10 AC

SPECIES	BDH 6"	12"	18"	24"	30"	>30"	BDH SAMPLE TOTAL (in)	MULTIPLIER (TOTAL AREA/SAMPLE AREA)	BDH AREA TOTAL (in)
CHERRY							0	53.60	0
CEDAR							0	53.60	0
ELM							0	53.60	0
MAPLE							0	53.60	0
OAK		4					48	53.60	2573
POPLAR		8					96	53.60	5146
SWEETGUM							0	53.60	0
PINE							0	53.60	0

V-9 REQUIRED TREE REMOVAL, TOTAL AREA: 4.08 AC, SAMPLE AREA: 0.23 AC

SPECIES	BDH 6"	12"	18"	24"	30"	>30"	BDH SAMPLE TOTAL (in)	MULTIPLIER (TOTAL AREA/SAMPLE AREA)	BDH AREA TOTAL (in)
CHERRY	1						6	17.77	107
CEDAR		2					24	17.77	427
ELM		1	1				30	17.77	533
MAPLE		1	1				30	17.77	533
OAK							0	17.77	0
POPLAR		5					60	17.77	1066
SWEETGUM		1					12	17.77	213
PINE		4	2	1	2		168	17.77	2986



BEARING BASIS:
TENNESSEE STATE PLANE
COORDINATE SYSTEM - NAD 1983
VERTICAL DATUM - NAVD 1988

LEGEND

- PROPERTY LINE
- PROPERTY ADJOINER LINE
- EASEMENT LINE (ESMT)
- CENTERLINE OF ROAD
- WATER LINE
- GAS LINE
- OVERHEAD UTILITY LINE
- SEWER LINE
- STORM DRAIN LINE
- OVERHEAD COMS LINE
- FLOW LINE
- DRAIN AREA LINE
- REBAR FOUND
- 5/8" REBAR WITH L.I. SMITH CAP SET
- UNMARKED POINT
- BENCHMARK
- CONCRETE SURFACE
- ASPHALT SURFACE
- GUY WIRE
- LIGHT POLE
- POWER POLE
- ELECTRICTRANSFORMER
- WATER METER
- WATER VALVE
- NATURAL GAS METER
- NATURAL GAS VALVE
- STORM MANHOLE
- CATCH BASIN
- CLEANOUT
- SIGN
- TELEPHONE PEDESTAL
- FIRE HYDRANT
- SEWER MANHOLE
- DECIDUOUS TREE
- EVERGREEN TREE
- EVERGREEN SHRUB

SITE DATA

A. OWNERS OF RECORD: HUNT PROPERTIES, 1031 GREYSTONE SQUARE, JACKSON, TN 38305; MORRIS CROCKER, 15 SUTTON PLACE, JACKSON, TN 38305

DEVELOPER: COMMUNITY DEVELOPMENT ENTERPRISES, 1104 WHITEHALL STREET, JACKSON, TN 38301

B. SOURCE OF TITLE: BOOK 733, PAGE 731 AND BOOK 257, PAGE 455; TAX MAP 65, PARCEL 103.00 AND 104.00

CITY OF JACKSON, MADISON COUNTY, TENNESSEE

SITE AREA = +/- 32 ACRES
TOTAL AREA = +/- 34.27 ACRES

C. THE PROPERTY DESCRIBED HEREON IS LOCATED IN UNSHADED FLOOD ZONE "X", AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS DETERMINED BY THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP NO. 47113O168E, DATED AUGUST 03, 2009.

Landscaping Requirements for

Hunt-Jackson Site

A. Existing Conditions of the 34-acre site:

1. Existing soils - This site had three major soils types, Collins silt, Feliciana silt, and Lexington silt loam.

a. Collins silt series consists of very deep, moderately well drained, moderately permeable soils. They formed in silty alluvium on flood plains of streams in the Southern Mississippi Valley Silty Uplands Major Land Resources Area. Slopes range from 0 - 2 percent.

b. Feliciana silt loam consists of very deep, well drained, moderately permeable soil in the Southern Mississippi Valley Loess Major Land Resources Area (MLRA 134). They formed in Peoria loess deposits more than 48 inches in thickness that overly terraces and uplands of the Southern Coastal Plain. Slopes range from 0 to 40 percent.

c. Lexington silt loam consists of very deep, well drained soils on level to moderately steep uplands. The soil formed in a mantle of loess about 2 to 3 feet thick and in the underlying loamy and sandy marine sediments. Slopes ranges from 0 to 30 percent.

2. Existing vegetation:

a. Existing trees are not ancient in nature. The existing vegetation is recent growth since the land has been cleared and farmed. A 1947 aerial photo shows the majority of the tract in cultivation. As recent as 1980, the heart of the property was still being cultivated. Within the last 10 years, a forest fire consumed the property from the middle over to the eastern boundary.

b. This Site does not show any evidence of past logging. New growth has been established through natural reseeding.

c. Ground cover that has taken over in the open area recently is the invasive weed, kudzu. The rest of the area is native ground cover of briars, ivy and other natural to the area.

3. Significant trees:

a. The accompanying map shows an estimate of the prevalent trees in each area.

b. Trees withing 50 feet of the property line that met the criteria of significant were located and shown on the map.

B. Site Utilization:

1. This Site will be used as a Solar Microgrid. The intended use for this site is to be full utilization of the entire property. The site will be graded to a gentle rolling grade with slopes that do not entice erosion.

2. The project Site will be covered with stone or rock over a membrane to allow for infiltration. No vegetative or tree planting will be undertaken on the site to establish new growth.

3. There is a proposed expansion of the facility to the tract to the north.

C. Vegetative Impact:

1. Solar Panels cannot be blocked by shadows caused by obstructions such as trees. Trees that are currently within 50 feet of the property line can reach heights of 70 to 100 feet. The most critical areas would be to the south and along the western and eastern boundaries. Due to the use and the fixtures on the site, vegetation and weedy plants would be a hindrance to the utilization.

a. All existing vegetation and tree will be removed from this site.

D. Proposed Replacement:

1. The proposed replacement would be evergreen shrubs or short evergreen trees placed in front of a chain link fence with mesh. This will provide an effective visual screen and secure the site. Some canopy trees will be placed along Roosevelt and near the battery storage buildings.

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

COMMUNITY DEVELOPMENT ENTERPRISES
JACKSON SOLAR MICROGRID
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

REVISIONS

THIS DRAWING SHALL BE CONSIDERED PRELIMINARY IN NATURE AND, IN NO WAY, FINAL OR COMPLETE, UNLESS THE SEAL OF THE ENGINEER OR SURVEYOR OF RECORD IS AFFIXED HERETO.

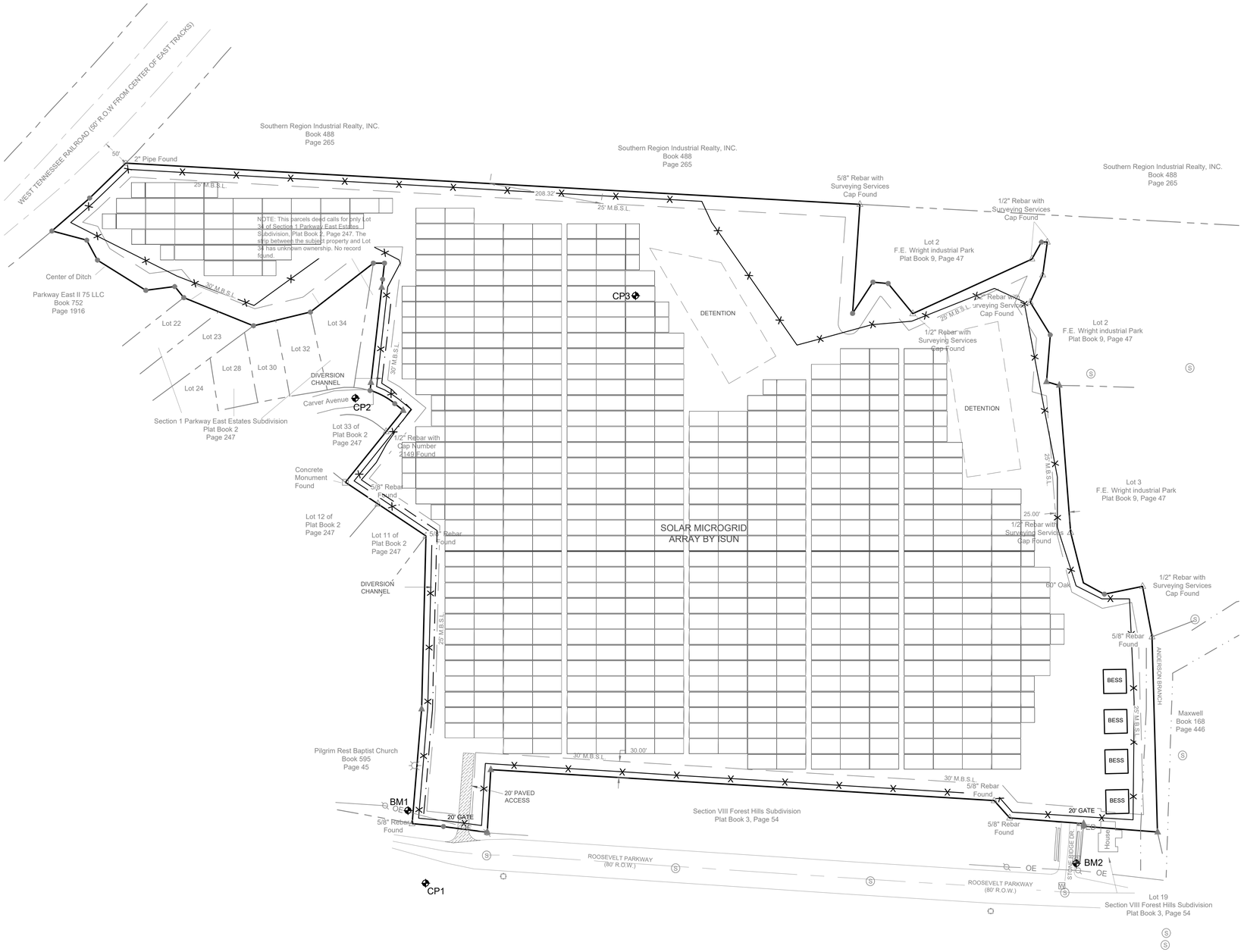
STATE OF TENNESSEE — LICENSED PROFESSIONAL ENGINEER — WILLIAM ANDREW SMITH — 120155 — 01/15/2021

SHEET: VEGETATIVE IMPACT EVALUATION
NUMBER: C-101

L.I. Smith and Associates, Inc.
LAND DEVELOPMENT | INFRASTRUCTURE DESIGN
SURVEYING SERVICES
302 North Caldwell Street, Paris, TN 38242 / 731-644-1014 / www.lismith.com
475 Metroplex Drive, Suite 212 Nashville, TN 37211 / 615-256-0290

DRAWN BY: NTG | CHECKED BY: WPS | SCALE: 1"=100' | DATE: 01/15/2021
PROJECT # 201044

NRI000058



N

BEARING BASIS:
TENNESSEE STATE PLANE
COORDINATE SYSTEM - NAD 1983
VERTICAL DATUM - NAVD 1988

LEGEND

PROPERTY LINE	GUY WIRE
PROPERTY ADJOINER LINE	LIGHT POLE
EASEMENT LINE (ESMT)	POWER POLE
CENTERLINE OF ROAD	ELECTRICTRANSFORMER
WATER LINE	WATER METER
GAS LINE	WATER VALVE
OVERHEAD UTILITY LINE	NATURAL GAS METER
SEWER LINE	NATURAL GAS VALVE
STORM DRAIN LINE	STORM MANHOLE
OVERHEAD COMS LINE	CATCH BASIN
FLOW LINE	CLEANOUT
DRAIN AREA LINE	SIGN
REBAR FOUND	TELEPHONE PEDESTAL
5/8" REBAR WITH L.I. SMITH CAP SET	FIRE HYDRANT
UNMARKED POINT	SEWER MANHOLE
BENCHMARK	DECIDUOUS TREE
CONCRETE SURFACE	EVERGREEN TREE
ASPHALT SURFACE	EVERGREEN SHRUB

SITE SPECIFIC LAYOUT NOTES:

1. A 10' WIDE LANDSCAPING BUFFER WILL BE MAINTAINED AROUND THE PERIMETER OF THE SITE.
2. 6,300 LINEAR FEET OF PERIMETER FENCING WILL BE INSTALLED. (2) 20' GATES WILL BE INSTALLED FOR ACCESS.
3. APPROXIMATELY 595 SOLAR PANEL SHEDS (8.77m x 8.35m) WILL BE INSTALLED AT A 5 DEGREE TILT.
4. (4) 44'x42' BATTERY ENERGY STORAGE COMPOUNDS (BESS) WILL BE CONSTRUCTED AT THE SOUTHEAST CORNER OF THE SITE TO BE ACCESSED BY STONE RIDGE DRIVE.
5. SEE ISUN ENERGY PRESENTATION FOR SOLAR PANEL DETAILS.
6. A DIVERSION CHANNEL WILL BE INSTALLED ALONG THE WESTERN PROPERTY LINE TO DIVERT OFFSITE WATER AROUND THE SITE.
7. (2) DETENTION PONDS WILL BE CONSTRUCTED AT THE REAR OF THE SITE.

FLOODPLAIN NOTE:

THE SITE IS LOCATED IN UNSHADED FLOOD ZONE "X", AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS DETERMINED BY THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP NO. 47113O168E, DATED AUGUST 03, 2009.

CONTROL				
ID	NORTHING	EASTING	ELEVATION	DESCRIPTION
CP1	485434.437	1138186.576	507.00	NAIL SET
CP2	486328.707	1138057.117	477.46	NAIL SET
CP3	486517.922	1138573.650	468.05	NAIL SET
BM1	485568.348	1138154.225	502.26	REBAR SET
BM2	485474.214	1139385.985	445.28	REBAR SET
COORDINATE SYSTEM - NAD 1983				
VERTICAL DATUM - NAVD 1988				

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

COMMUNITY DEVELOPMENT ENTERPRISES
JACKSON SOLAR MICROGRID
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

REVISIONS

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SHEET: LAYOUT

NUMBER: C-200

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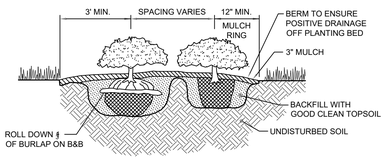
PROJECT # 201044 | DATE: 01/15/2021

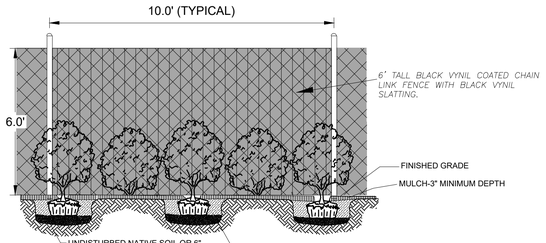
NRI000059



SHRUB / GROUND COVER PLANTING

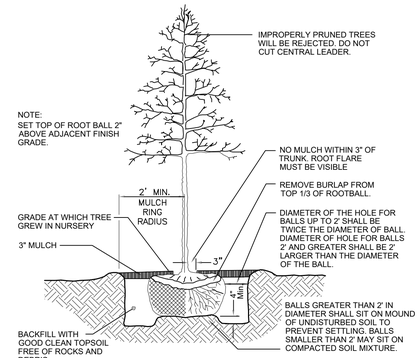
NOTES:

1. PLANT MATERIAL SHALL CONFORM TO "THE AMERICAN STANDARD FOR NURSERY STOCK" (ANSI Z60.1; LATEST EDITION) FOR SIZE FORM AND QUALITY
2. MYCORRHIZAL INOCULATES AND SUPER - ABSORBENT MATERIAL ADDED TO TOPSOIL BACKFILL AT THE MANUFACTURER'S RECOMMENDED RATE AS PER SPECIFICATIONS



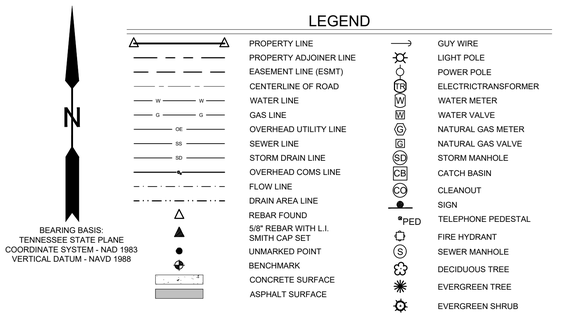
SCREENING ELEVATION VIEW

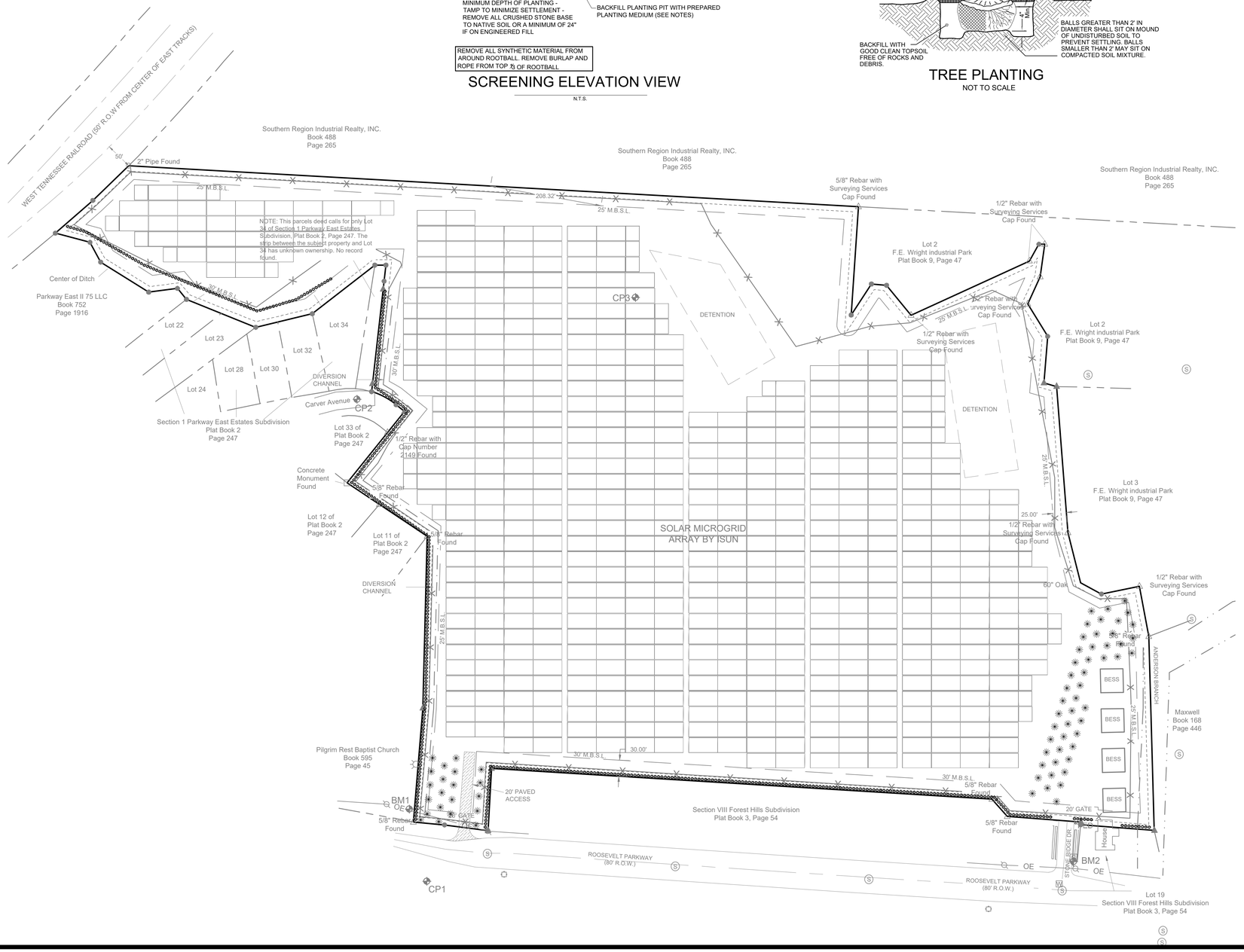
N.T.S.



TREE PLANTING

NOT TO SCALE





LANDSCAPING NOTES:

TOTAL SITE AREA:	34.27 ACRES
TOTAL GREEN SPACE:	11.50 ACRES
GREEN SPACE % OF SITE:	33.5%

1. ALL LANDSCAPING SHALL BE IN ACCORDANCE WITH THE CITY OF JACKSON ZONING ORDINANCE ARTICLE VI SECTION 23 AND CITY OF JACKSON LANDSCAPE STANDARDS AND PRACTICES.
2. A 10' WIDE LANDSCAPING BUFFER WILL BE MAINTAINED AROUND THE PERIMETER OF THE SITE.
3. 343 CANOPY TREES WILL BE PLANTED AROUND THE PERIMETER AND IN THE GREEN SPACES ON THE SITE.
4. MINIMUM TREE SPACING SHALL BE 25'.
5. TREES TO HAVE A MINIMUM CALIPER OF 1 ½" AND SHALL HAVE A MAXIMUM MATURE HEIGHT OF 30'.
6. ALL TREES TO CONFORM TO ACCEPTABLE TREES UNDER 30 FEET AS LISTED IN THE CITY OF JACKSON LANDSCAPE STANDARDS & PRACTICES.
7. EVERGREEN SHRUBS SHALL BE PLANTED IN ACCORDANCE WITH THE CITY OF JACKSON ZONING ORDINANCE ARTICLE VI SECTION 23 AND CITY OF JACKSON LANDSCAPE STANDARDS AND PRACTICES.
8. EVERGREEN SHRUBS SHALL HAVE A MINIMUM SPACING OF 3'. SHRUBS SHOULD FOR VISUAL BARRIER ADJACENT TO ALL RESIDENTIAL PROPERTIES.
9. A 6' TALL CHAINLINK FENCE WITH SLATS WILL BE ERECTED AROUND THE PERIMETER OF THE SITE.

FLOODPLAIN NOTE:

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COORDINATE SYSTEM - NAD 1983				
VERTICAL DATUM - NAVD 1988				

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

COMMUNITY DEVELOPMENT ENTERPRISES
JACKSON SOLAR MICROGRID
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

REVISIONS

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L. Smith
REGISTERED ENGINEERING CONSULTANTS
ASSOCIATES, INC.
WILLIAM
STATE OF TENNESSEE
REGISTERED LANDSCAPE ARCHITECT

SHEET: LANDSCAPING
NUMBER: C-201

L.I. Smith and Associates, Inc.
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SURVEYING SERVICES

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475 Metroplex Drive, Suite 212 Nashville, TN 37211 | 615-256-0290

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PROJECT # 201044 | DATE: 01/15/2021

NRI000060

PROPOSED PIPE TABLE												
FROM		TO		PIPE								
STRUCTURE	INV. ELEVATION	STRUCTURE	INV. ELEVATION	MATERIAL	DIAMETER	LENGTH	SLOPE	DRAIN AREA (AC)	FULL PIPE VELOCITY (FPS)	PIPE FLOW CAPACITY (CFS)	10 YR DESIGN FLOW (CFS)	
1	448.00	2	446.32	RCP	24"	84	2.00%	12.49	8.83	27.73	19.05	
2	435.78	3	435.00	RCP	24"	39	2.00%	12.49	8.83	27.73	19.05	
4	449.00	5	448.00	RCP	24"	50	2.00%	13.65	8.83	27.73	18.93	
5	442.58	6	442.00	RCP	24"	29	2.00%	13.65	8.83	27.73	18.93	
7	441.50	8	441.00	RCP	36"	54	0.93%	9.73	8.18	57.81	38.43	

PROPOSED BOX CULVERT													
FROM		TO		SINGLE BARREL CULVERT									
STRUCTURE	INV. ELEVATION	STRUCTURE	INV. ELEVATION	SPAN HEIGHT	SPAN WIDTH	LENGTH	SLOPE	DRAIN AREA (AC)	MAX COVER (FT)	FULL PIPE VELOCITY (FPS)	PIPE FLOW CAPACITY (CFS)	10 YR DESIGN FLOW (CFS)	100 YR DESIGN FLOW (CFS)
9	440.50	10	433.50	72"	96"	720	0.97%	84.20	25.00	13.00	520	326.31	463

PROPOSED STRUCTURE TABLE							
STRUCTURE	TYPE	RIM	INV. IN	INV. OUT	DEPTH	AREA (AC)	10YR (CFS)
1	Detention outlet	454.00	448.00	444.00	10.00	12.49	19.05
2	CB No. 42	451.00	442.32	435.78	15.22	12.49	19.05
3	Headwall	437.75		435.00	2.75	12.49	19.05
4	Detention outlet	455.00	449.00	445.00	10.00	13.65	18.93
5	CB No. 42	454.00	444.00	442.58	11.42	13.65	18.93
6	Headwall	444.75		442.00	2.75	13.65	18.93
7	CB No. 42	467.5		441.50	26.00	0.06	0.46
8	Discharge to WingWall			441.00		0.13	0.67
9	WING WALL 45°		440.50				
10	WING WALL 45°			433.50			

GRADING LEGEND:

1. 2' TALL CONTAINMENT BERM (REF. C-904)
2. DIVERSION CHANNEL/BERM (REF. C-904)
3. 285 LF MSE RETAINING WALL
4. DETENTION POND 1
   DEPTH= 9' VOL= 3.27 AC-FT SPILLWAY ELEV= 456.00'
5. DETENTION POND 2
   DEPTH= 9' VOL= 3.73 AC-FT SPILLWAY ELEV= 457.00'
6. RIP RAP CHANNEL LINING
7. 10'x35' CLASS A-1 RIP RAP 2' MIN ON GEOTEXTILE FABRIC
8. 20' WIDE CONCRETE SPILLWAY
9. SLOPE STABILIZATION CLASS A-1 RIP RAP 2' MIN ON GEOTEXTILE FABRIC
10. ANDERSON BRANCH SLOPE STABILIZATION CLASS A-1 RIP RAP 2.5' MIN ON GEOTEXTILE FABRIC
11. 6'x8' REINFORCED CONCRETE BOX CULVERT (REF C-901)

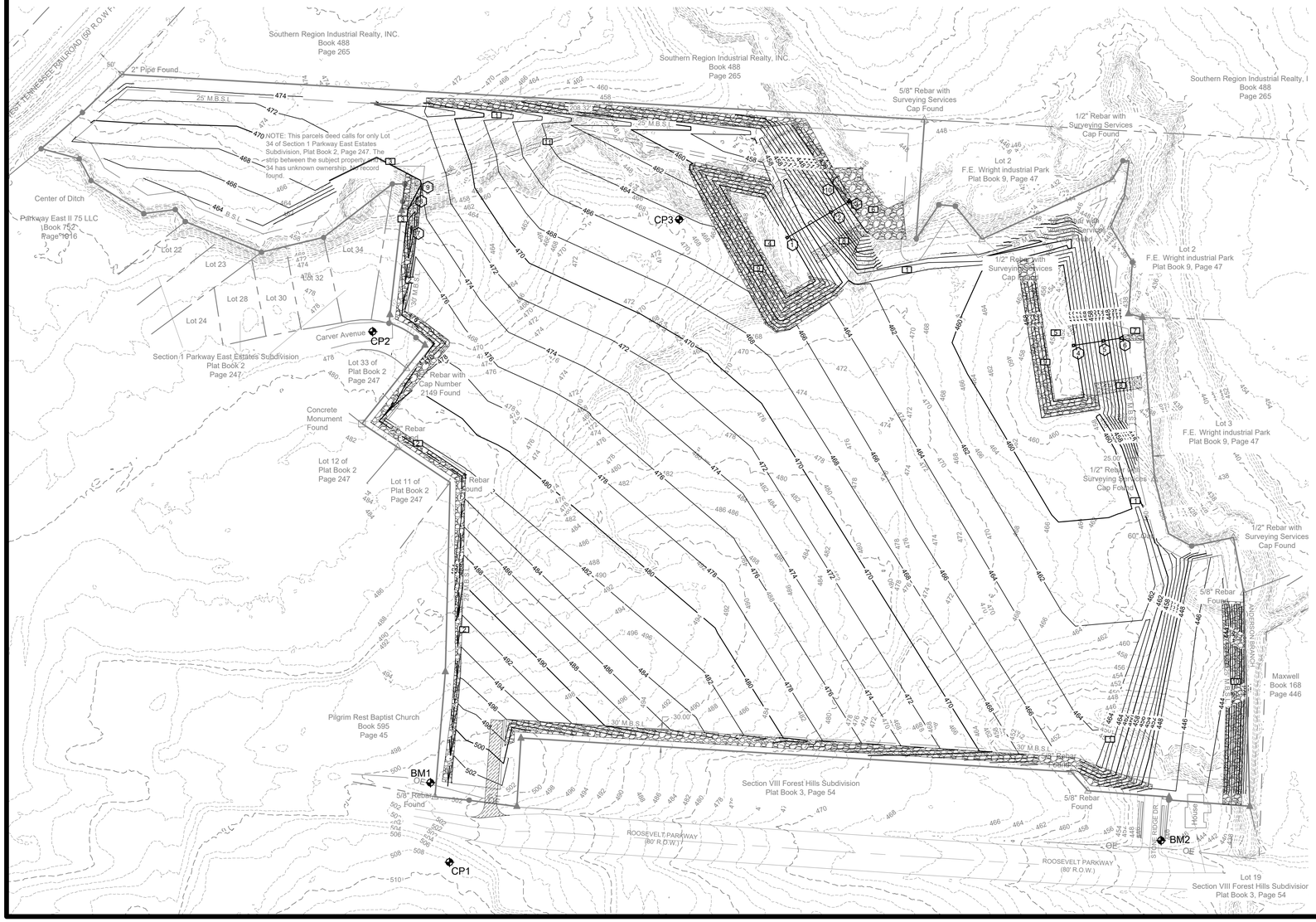
(X) STORMWATER STRUCTURE

LEGEND

N

BEARING BASIS:
TENNESSEE STATE PLANE
COORDINATE SYSTEM - NAD 1983
VERTICAL DATUM - NAVD 1988

- PROPERTY LINE
- PROPERTY ADJOINER LINE
- EASEMENT LINE (ESMT)
- CENTERLINE OF ROAD
- WATER LINE
- GAS LINE
- OVERHEAD UTILITY LINE
- SEWER LINE
- STORM DRAIN LINE
- OVERHEAD COMS LINE
- FLOW LINE
- DRAIN AREA LINE
- REBAR FOUND
- 5/8" REBAR WITH L.I. SMITH CAP SET
- UNMARKED POINT
- BENCHMARK
- CONCRETE SURFACE
- ASPHALT SURFACE
- GUY WIRE
- LIGHT POLE
- POWER POLE
- ELECTRICTRANSFORMER
- WATER METER
- WATER VALVE
- NATURAL GAS METER
- NATURAL GAS VALVE
- STORM MANHOLE
- CATCH BASIN
- CLEANOUT
- SIGN
- TELEPHONE PEDESTAL
- FIRE HYDRANT
- SEWER MANHOLE
- DECIDUOUS TREE
- EVERGREEN TREE
- EVERGREEN SHRUB



SITE GRADING NOTES:

1. AN EXISTING WET WEATHER CONVEYANCE (WWC1) WILL BE REPLACED WITH 720' OF 6'x8' REINFORCED CONCRETE BOX CULVERT.
2. EXISTING WWC WILL BE FILLED IN. EXISTING CHANNEL WALLS WILL BE BENCHED BACK AT EACH 6" LIFT TO ENSURE PROPER COMPACTION AND COHESION TO EXISTING SOILS.
3. ALL FILL MATERIAL SHALL BE PLACED IN 6" LIFTS AND COMPACTED TO A 95% STANDARD PROCTOR. (ASTM D698)
4. SITE GRADES WILL SLOPE GENERALLY TOWARDS THE NORTH EAST AT 3-5% SLOPES.
5. A DIVERSION CHANNEL/BERM WILL BE CONSTRUCTED ALONG THE WEST SIDE OF THE SITE. THIS DIVERSION CHANNEL WILL DIRECT OFFSITE WATER AROUND THE SITE TO A DROP INLET THAT WILL DISCHARGE INTO THE WINGWALL OF THE NEW BOX CULVERT. DIVERSION CHANNEL WILL BE STABILIZED WITH CLASS A-1 RIP RAP AT A MIN. DEPTH OF 2 OVER GEOTEXTILE FABRIC'.
6. A 2' TALL CONTAINMENT BERM WILL BE CONSTRUCTED ALONG THE LOWER END OF THE SITE. CONTAINMENT BERM WILL DIVERT STORMWATER RUNOFF FROM THE SITE INTO ONE OF TWO DETENTION PONDS.
7. FILL SLOPES ALONG THE NORTH PROPERTY LINE WILL BE STABILIZED WITH CLASS A-1 RIP RAP AT A MIN DEPTH OF 2' OVER GEOTEXTILE FABRIC.
8. FORE SLOPES OF BOTH DETENTION PONDS WILL BE STABILIZED WITH CLASS A-1 RIP RAP AT A MIN DEPTH OF 2' OVER GEOTEXTILE FABRIC.
9. EXISTING CHANNEL WILL BE LINED FOR 135 BELOW THE OUTLET HEADWALL OF THE NEW BOX CULVERT WITH CLASS A-1 RIP RAP AT A MIN DEPTH OF 3' OVER GEOTEXTILE FABRIC.
10. FINAL GRADED SURFACE WILL BE WHITE POLYMER SEALED AGGREGATE.

POND NOTE:
CONTRACTOR TO ENSURE POST CONSTRUCTION SEDIMENT REMOVAL TO ENSURE FINAL POND ELEVATIONS ARE MAINTAINED AND FUNCTION AS INTENDED.

CONTROL			
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GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
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COMMUNITY DEVELOPMENT ENTERPRISES
JACKSON SOLAR MICROGRID
ROOSEVELT PARKWAY
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REVISIONS

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Joseph Gregory Smith
LICENSED PROFESSIONAL ENGINEER
STATE OF TENNESSEE
102.0000

SHEET: GRADING
NUMBER: C-300

L.I. Smith and Associates, Inc.
LAND DEVELOPMENT | INFRASTRUCTURE DESIGN
SURVEYING SERVICES
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DRAWN BY: NTG | CHECKED BY: WPS | SCALE: 1"=100'
PROJECT # 201044 | DATE: 01/15/2021

COMMUNITY DEVELOPMENT ENTERPRISES
JACKSON SOLAR MICROGRID
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

EROSION CONTROL LEGEND

- LIMITS OF CONSTRUCTION
- WBSF — WBSF — WIRE BACKED SILT FENCE
- CHECK DAM
- INLET PROTECTION
- LANDSCAPING/SUITABLE COVER

OUTFALL #	LATITUDE (N)	LONGITUDE (W)	APPROX. ELEV. (FEET)	PRE AREA (ACRES)	POST AREA (ACRES)	RECIEVING WATERS
OUTFALL 1	35.637373	88.796385	463	0.98	0.98	ANDERSON BRANCH
OUTFALL 2	35.637331	88.795473	461	1.14	1.14	ANDERSON BRANCH
OUTFALL 3	35.633755	88.794744	457	0.64	0.47	ANDERSON BRANCH
OUTFALL 4	35.637763	88.794225	455	0.67	0.00	ANDERSON BRANCH
OUTFALL 5	35.637675	88.792950	436	0.91	1.26	ANDERSON BRANCH
OUTFALL 6	35.637470	88.794722	445	0.40	9.34	ANDERSON BRANCH
OUTFALL 7	35.637471	88.794206	450	9.73	0.00	ANDERSON BRANCH
OUTFALL 8	35.637401	88.792955	440	10.12	12.49	ANDERSON BRANCH
OUTFALL 9	35.637285	88.792312	442	0.83	0.00	ANDERSON BRANCH
OUTFALL 10	35.636967	88.790871	442	6.07	13.65	ANDERSON BRANCH
OUTFALL 11	35.635639	88.790160	430	2.06	0.43	ANDERSON BRANCH
OUTFALL 12	35.634869	88.790127	427	7.13	2.89	ANDERSON BRANCH

NOTICE OF COVERAGE HAS BEEN ISSUED FOR A GENERAL CONSTRUCTION PERMIT AND ASSOCIATED GENERAL ARAP PERMIT THROUGH TDEC.

PERMITTED DISTURBANCE: 32 ACRES
TDEC PERMIT NUMBERS:
TNR 122460
NR 2102.014

LEGEND

- PROPERTY LINE
- PROPERTY ADJOINER LINE
- EASEMENT LINE (ESMT)
- CENTERLINE OF ROAD
- WATER LINE
- GAS LINE
- OVERHEAD UTILITY LINE
- SEWER LINE
- STORM DRAIN LINE
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- FLOW LINE
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- NATURAL GAS VALVE
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- CATCH BASIN
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- SIGN
- TELEPHONE PEDESTAL
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- DECIDUOUS TREE
- EVERGREEN TREE
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N

BEARING BASIS:
TENNESSEE STATE PLANE
COORDINATE SYSTEM - NAD 1983
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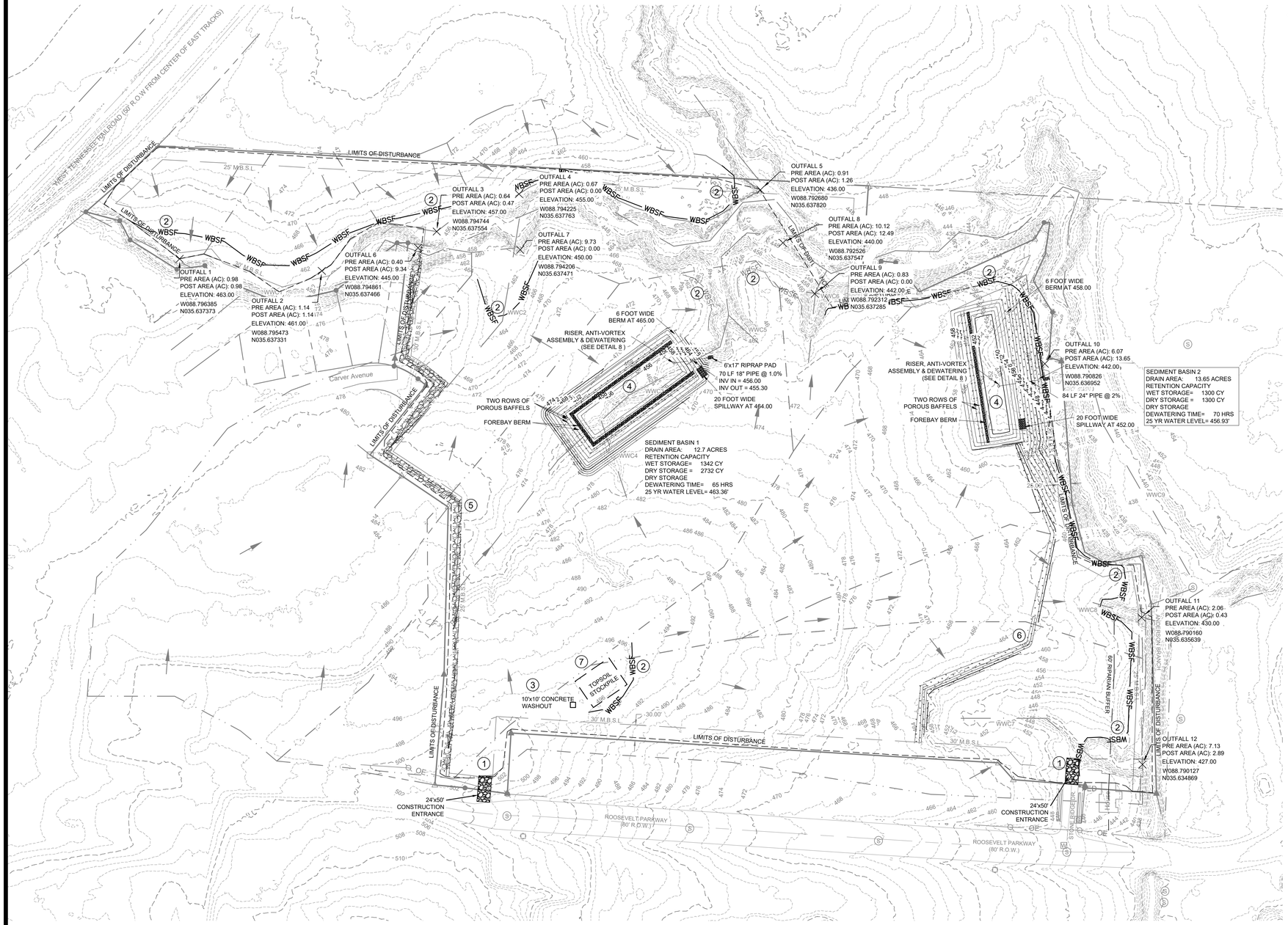

EROSION CONTROL NOTES:

1. NO TREES ARE TO BE REMOVED AND/OR VEGETATION DISTURBED EXCEPT AS NECESSARY FOR GRADING PURPOSES AND ONLY AS APPROVED BY OWNER'S REPRESENTATIVE AND TOWN ENGINEER.
2. TOPSOIL IS TO BE STRIPPED FROM ALL CUT AND FILL AREAS, STOCKPILED AND REDISTRIBUTED OVER GRADED AREAS TO A MINIMUM OF 6".
3. ALL GRADED AREAS, INCLUDING SLOPES, ARE TO BE STABILIZED AS SOON AS POSSIBLE AFTER GRADING IS COMPLETED, BUT NO LONGER THAN 14 DAYS LATER.
4. CONSTRUCT EROSION CONTROL AS SHOWN ON DRAWINGS PRIOR TO BEGINNING GRADING OPERATIONS.
5. ALL NEW STRUCTURES AND EXISTING STRUCTURES SHALL HAVE SEDIMENT REMOVED PRIOR TO ACCEPTANCE.
6. SILT BARRIERS SHALL BE CLEANED OF ACCUMULATED SEDIMENT WHEN APPROXIMATELY 33% FILLED WITH SUCH SEDIMENT.
7. ALL DIMENSIONS AND LOCATIONS OF TEMPORARY EROSION AND WATER POLLUTION CONTROL DEVICES SHALL BE SUBJECT TO ADJUSTMENT AS DESIGNATED BY THE OWNER'S REPRESENTATIVE AND TOWN ENGINEER.
8. WHEN THE TEMPORARY SOIL EROSION AND WATER POLLUTION DEVICES ARE NO LONGER REQUIRED FOR THE INTENDED PURPOSE IN THE OPINION OF THE OWNER'S REPRESENTATIVE AND TOWN ENGINEER, THEY SHALL BE REMOVED.
9. REPLACE SILT BARRIERS WHEN CONDITIONS WARRANT AND AS DIRECTED BY THE OWNER'S REPRESENTATIVE AND TOWN ENGINEER.
10. ALL SLOPES 3:1 OR STEEPER SHALL BE STABILIZED WITH EROSION CONTROL MATTING INSTALLED PER MANUFACTURERS' RECOMMENDATIONS, OR SOD.
11. ANY MUD/CONSTRUCTION DEBRIS THAT MAY BE TRANSPORTED TO SURROUNDING ROADS, OR OTHER SURROUNDING ROADS OR PARKING AREAS SHALL BE CLEANED UP IMMEDIATELY.
12. GENERAL CONTRACTOR SHALL KEEP GROUND DISTURBANCE TO THE MINIMUM REQUIRED TO COMPLETE THE PROJECT. ALL AREAS MUST BE TEMPORARILY OR PERMANENTLY STABILIZED IF DISTURBED AREA HAS NOT BEEN WORKED WITHIN THE PAST 14 DAYS.
13. SOD SHALL BE TURF TYPE TALL FESCUE.
14. TIME OF EXPOSURE OF UNPROTECTED SOILS SHALL BE KEPT TO A MAXIMUM PERIOD OF 7 DAYS. TEMPORARY STABILIZATION MEASURES, I.E. SEEDING & MULCHING, SHALL BE PERFORMED ON ANY UNPROTECTED AREA WHERE CONSTRUCTION OPERATIONS WILL CEASE FOR 7 OR MORE DAYS.
15. KEEP DUST WITHIN TOLERABLE LIMITS BY SPRINKLING OR OTHER ACCEPTABLE MEANS.
16. CONSTRUCTION ENTRANCE SHALL BE IN PLACE PRIOR TO ANY COMBUSTIBLES, I.E. CONSTRUCTION TRAILER, LUMBER, ETC. BEING PRESENT ON JOB SITE. IN ADDITION TO THE CONSTRUCTION ENTRANCE, AN ALL WEATHER DRIVE MUST BE IN PLACE AND ACCESSIBLE TO ALL AREAS OF THE CONSTRUCTION SITE THAT WILL CONTAIN COMBUSTIBLES THROUGHOUT ALL PHASES OF THE CONSTRUCTION PROCESS. THE ALL WEATHER DRIVE SHALL BE NO LESS THAN 20 FEET OF UNOBSTRUCTED WIDTH WITH ADEQUATE TURNING RADIUS CAPABLE OF SUPPORTING THE IMPOSED LOADS OF THE FIRE DEPARTMENT APPARATUS.
17. USE TEMPORARY VEGETATION AND/OR MULCH TO PROTECT BARE AREAS FROM EROSION DURING CONSTRUCTION.
18. NO OTHER WORK WILL BE INITIATED ON THE PROJECT UNTIL THE EROSION/SILTATION MEASURES SHOWN ON THE PLANS AND DETAILS ARE PROPERLY IN PLACE.
19. IF, AT ANY TIME DURING THE CONSTRUCTION PHASE OF THIS PROJECT, THE EROSION/SILTATION MEASURES INSTALLED FAIL TO FUNCTION PROPERLY, NEED MAINTENANCE OR REPAIR, OR NEED NEW REPLACEMENT IN ANY KIND, THE CONTRACTOR WILL EFFECT SUCH ACTIONS AS ARE NEEDED TO CORRECT THE SITUATION AT NO ADDITIONAL COST TO THE OWNER.
20. DISTURBED AREAS ARE TO BE GRADED TO DRAIN AS INDICATED ON PLAN TO SEDIMENT BARRIERS DURING AND UPON COMPLETION OF CONSTRUCTION.
21. ALL CUT/FILL AREAS TO BE LANDSCAPED OR THAT HAVE A VEGETATIVE COVER POST-CONSTRUCTION, SHALL HAVE A MINIMUM OF 6-INCH DEPTH TOPSOIL COVER. AREAS DRESSED WITH TOPSOIL SHALL BE SODDED AS SHOWN ON SHEET L1, LANDSCAPING PLAN.
22. UPON STABILIZATION OF THE PROJECT SITE WITH A GOOD (ACCEPTABLE) STAND OF GRASS AND/OR GROUND COVER, THE EROSION/SILTATION INSTALLATIONS WILL BE REMOVED AND THE AREA DISTURBED WILL BE SODDED AS OTHER NEW GRASSED AREAS OF THE PROJECT.

SITE SPECIFIC EROSION CONTROL NOTES:

1. CONTRACTOR TO INSTALL AND MAINTAIN VEHICLE TRACKING CONTROL (CONSTRUCTION ENTRANCE/EXIT) (REF C-900).
2. CONTRACTOR TO INSTALL AND MAINTAIN WIRE BACKED SILT FENCE PERIMETER (REF. C-900).
3. CONTRACTOR TO INSTALL AND MAINTAIN 10' X 10' CONCRETE WASHOUT PIT WITH DIRECTIONAL SIGNS (REF. C-900).
4. CONSTRUCT A SEDIMENT BASIN WITH ASSOCIATED RISER, DISCHARGE, FOREBAY, AND POROUS BAFFELS. (REF. C-900).
5. CONSTRUCT A DIVERSION DITCH TO ROUTE 9.33 ACRES OF OFFSITE DRAINAGE AROUND THE SITE AT OUTFALL 6 (REF. C-904) TO KEEP DRAINAGE AREA TO OUTFALL 7 UNDER 5 ACRES..
6. CONSTRUCT A DIVERSION BERM TO ROUTE 5.5 ACRES OF DRAINAGE TO SEDIMENT BASIN 2 TO KEEP THE DRAINAGE AREA TO OUTFALL 12 UNDER 5 ACRES (REF. C-904).
7. STOCKPILE TOPSOIL AT DESIGNATED AREA, TO BE PROTECTED WITH SILT FENCE DOWNSLOPE.

FLOODPLAIN NOTE:

THE SITE IS LOCATED IN UNSHADED FLOOD ZONE "X", AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS DETERMINED BY THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP NO. 47113O168E, DATED AUGUST 03, 2009.

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

REVISIONS

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SHEET: E.P.S.C PHASE 1
NUMBER: C-400

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475 Metroplex Drive, Suite 212 Nashville, TN 37211 | 615-256-0290

DRAWN BY: NTG	CHECKED BY: WPS	SCALE: 1"=100'
PROJECT # 201044		DATE: 01/15/2021

NRI000062

COMMUNITY DEVELOPMENT ENTERPRISES
JACKSON SOLAR MICROGRID
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

OUTFALL #	LATITUDE (N)	LONGITUDE (W)	APPROX. ELEV. (FEET)	PRE AREA (ACRES)	POST AREA (ACRES)	RECIEVING WATERS
OUTFALL 1	35.637373	88.796385	463	0.98	0.98	ANDERSON BRANCH
OUTFALL 2	35.637331	88.795473	461	1.14	1.14	ANDERSON BRANCH
OUTFALL 3	35.633755	88.794744	457	0.64	0.47	ANDERSON BRANCH
OUTFALL 4	35.637763	88.794225	455	0.67	0.00	ANDERSON BRANCH
OUTFALL 5	35.637675	88.792950	436	0.91	1.26	ANDERSON BRANCH
OUTFALL 6	35.637470	88.794722	445	0.40	9.34	ANDERSON BRANCH
OUTFALL 7	35.637471	88.794206	450	9.73	0.00	ANDERSON BRANCH
OUTFALL 8	35.637401	88.792955	440	10.12	12.49	ANDERSON BRANCH
OUTFALL 9	35.637285	88.792312	442	0.83	0.00	ANDERSON BRANCH
OUTFALL 10	35.636967	88.790871	442	6.07	13.65	ANDERSON BRANCH
OUTFALL 11	35.635639	88.790160	430	2.06	0.43	ANDERSON BRANCH
OUTFALL 12	35.634869	88.790127	427	7.13	2.89	ANDERSON BRANCH

NOTICE OF COVERAGE HAS BEEN ISSUED FOR A GENERAL CONSTRUCTION PERMIT AND ASSOCIATED GENERAL ARAP PERMIT THROUGH TDEC.

PERMITTED DISTURBANCE: 32 ACRES
TDEC PERMIT NUMBERS:
TNR 122460
NR 2102.014

EROSION CONTROL LEGEND

- LIMITS OF CONSTRUCTION
- WBSF — WBSF — WIRE BACKED SILT FENCE
- CHECK DAM
- INLET PROTECTION
- LANDSCAPING/SUITABLE COVER

LEGEND

- PROPERTY LINE
- PROPERTY ADJOINER LINE
- EASEMENT LINE (ESMT)
- CENTERLINE OF ROAD
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- SEWER LINE
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- FLOW LINE
- DRAIN AREA LINE
- REBAR FOUND
- 5/8" REBAR WITH L.I. SMITH CAP SET
- UNMARKED POINT
- BENCHMARK
- CONCRETE SURFACE
- ASPHALT SURFACE
- GUY WIRE
- LIGHT POLE
- POWER POLE
- ELECTRICTRANSFORMER
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- WATER VALVE
- NATURAL GAS METER
- NATURAL GAS VALVE
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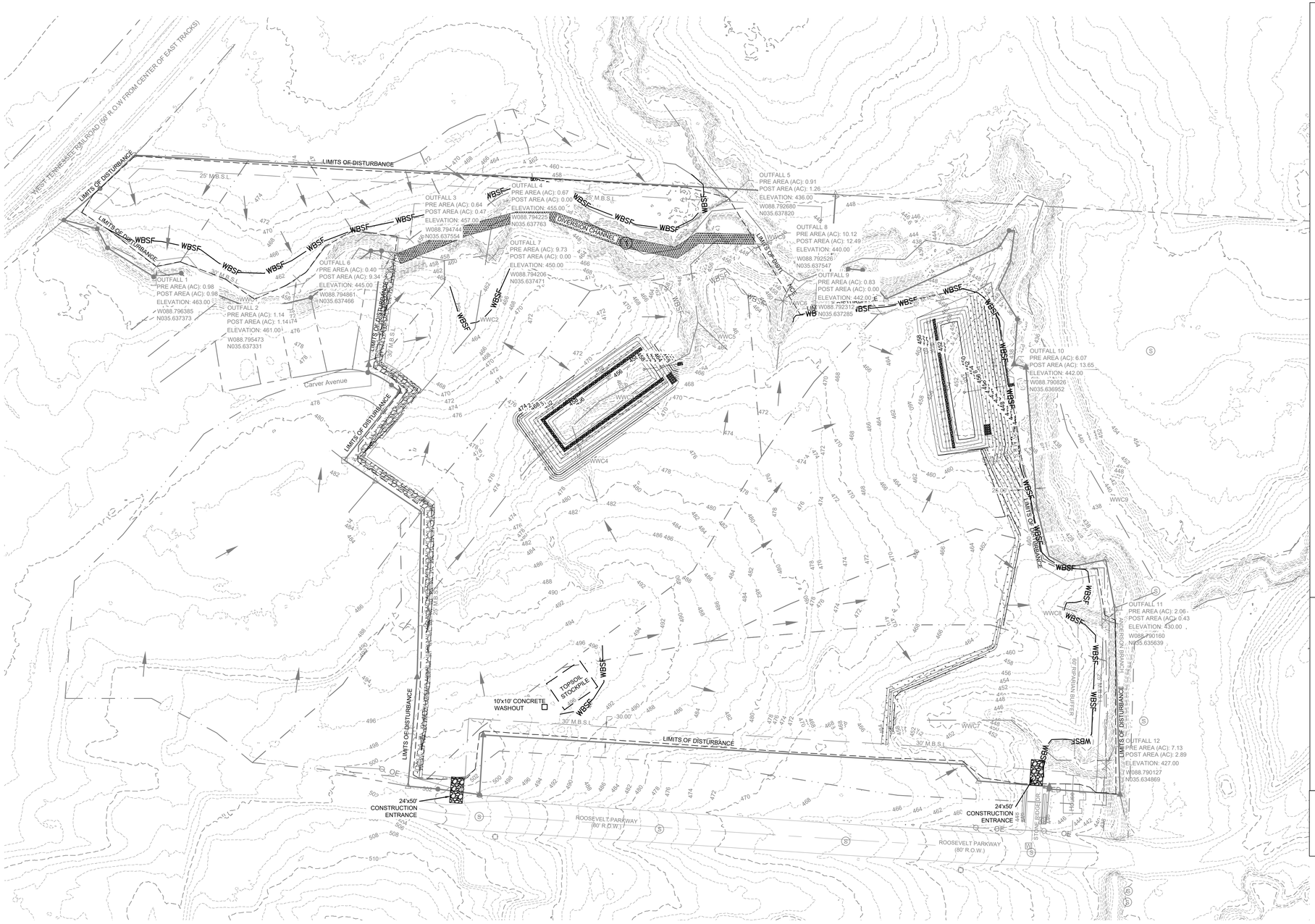
- CATCH BASIN
- CLEANOUT
- SIGN
- TELEPHONE PEDESTAL
- FIRE HYDRANT
- SEWER MANHOLE
- DECIDUOUS TREE
- EVERGREEN TREE
- EVERGREEN SHRUB

N

BEARING BASIS:
TENNESSEE STATE PLANE
COORDINATE SYSTEM - NAD 1983
VERTICAL DATUM - NAVD 1988



EROSION CONTROL NOTES:

1. NO TREES ARE TO BE REMOVED AND/OR VEGETATION DISTURBED EXCEPT AS NECESSARY FOR GRADING PURPOSES AND ONLY AS APPROVED BY OWNER'S REPRESENTATIVE AND TOWN ENGINEER.
2. TOPSOIL IS TO BE STRIPPED FROM ALL CUT AND FILL AREAS, STOCKPILED AND REDISTRIBUTED OVER GRADED AREAS TO A MINIMUM OF 6".
3. ALL GRADED AREAS, INCLUDING SLOPES, ARE TO BE STABILIZED AS SOON AS POSSIBLE AFTER GRADING IS COMPLETED, BUT NO LONGER THAN 14 DAYS LATER.
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15. KEEP DUST WITHIN TOLERABLE LIMITS BY SPRINKLING OR OTHER ACCEPTABLE MEANS.
16. CONSTRUCTION ENTRANCE SHALL BE IN PLACE PRIOR TO ANY COMBUSTIBLES, I.E. CONSTRUCTION TRAILER, LUMBER, ETC. BEING PRESENT ON JOB SITE. IN ADDITION TO THE CONSTRUCTION ENTRANCE, AN ALL WEATHER DRIVE MUST BE IN PLACE AND ACCESSIBLE TO ALL AREAS OF THE CONSTRUCTION SITE THAT WILL CONTAIN COMBUSTIBLES THROUGHOUT ALL PHASES OF THE CONSTRUCTION PROCESS. THE ALL WEATHER DRIVE SHALL BE NO LESS THAN 20 FEET OF UNOBSTRUCTED WIDTH WITH ADEQUATE TURNING RADIUS CAPABLE OF SUPPORTING THE IMPOSED LOADS OF THE FIRE DEPARTMENT APPARATUS .
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21. ALL CUT/FILL AREAS TO BE LANDSCAPED OR THAT HAVE A VEGETATIVE COVER POST-CONSTRUCTION, SHALL HAVE A MINIMUM OF 6-INCH DEPTH TOPSOIL COVER. AREAS DRESSED WITH TOPSOIL SHALL BE SODDED AS SHOWN ON SHEET L1, LANDSCAPING PLAN.
22. UPON STABILIZATION OF THE PROJECT SITE WITH A GOOD (ACCEPTABLE) STAND OF GRASS AND/OR GROUND COVER, THE EROSION/SILTATION INSTALLATIONS WILL BE REMOVED AND THE AREA DISTURBED WILL BE SODDED AS OTHER NEW GRASSED AREAS OF THE PROJECT.

SITE SPECIFIC EROSION CONTROL NOTES:

(1) CONSTRUCT DIVERSION CHANNEL IN EXISTING CHANNEL TO ROUTE WATER AROUND THE CONSTRUCTION OF THE BOX CULVERT . WORK AREA WILL BE PROTECTED WITH SANDBAG COFFER DAMS THROUGHOUT CONSTRUCTION. DIVERSION CHANNEL MUST HAVE A MINIMAL CROSS SECTIONAL AREA OF 32 SQUARE FEET (REF. C-903).

ANY WATER THAT IS PUMPED FROM WORK AREA MUST BE PUMPED THROUGH A SEDIMENT FILTER BAG.

FLOODPLAIN NOTE:

THE SITE IS LOCATED IN UNSHADED FLOOD ZONE "X", AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS DETERMINED BY THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP NO. 471130168E, DATED AUGUST 03, 2009.

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

REVISIONS

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L. I. Smith — REGISTERED PROFESSIONAL ENGINEER — STATE OF TENNESSEE

SHEET: E.P.S.C PHASE 2
NUMBER: C-401

L.I. Smith and Associates, Inc.
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475 Metroplex Drive, Suite 212 Nashville, TN 37211 | 615-256-0290

DRAWN BY: NTG | CHECKED BY: WPS | SCALE: 1"=100'
PROJECT # 201044 | DATE: 01/15/2021

NRI000063

COMMUNITY DEVELOPMENT ENTERPRISES
JACKSON SOLAR MICROGRID
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

OUTFALL #	LATITUDE (N)	LONGITUDE (W)	APPROX. ELEV. (FEET)	PRE AREA (ACRES)	POST AREA (ACRES)	RECIEVING WATERS
OUTFALL 1	35.637373	88.796385	463	0.98	0.98	ANDERSON BRANCH
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NOTICE OF COVERAGE HAS BEEN ISSUED FOR A GENERAL CONSTRUCTION PERMIT AND ASSOCIATED GENERAL ARAP PERMIT THROUGH TDEC.

PERMITTED DISTURBANCE: 32 ACRES
TDEC PERMIT NUMBERS:
TNR 122460
NR 2102.014

EROSION CONTROL LEGEND

- LIMITS OF CONSTRUCTION
- WBSF — WBSF — WIRE BACKED SILT FENCE
- CHECK DAM
- INLET PROTECTION
- LANDSCAPING/SUITABLE COVER

LEGEND

- PROPERTY LINE
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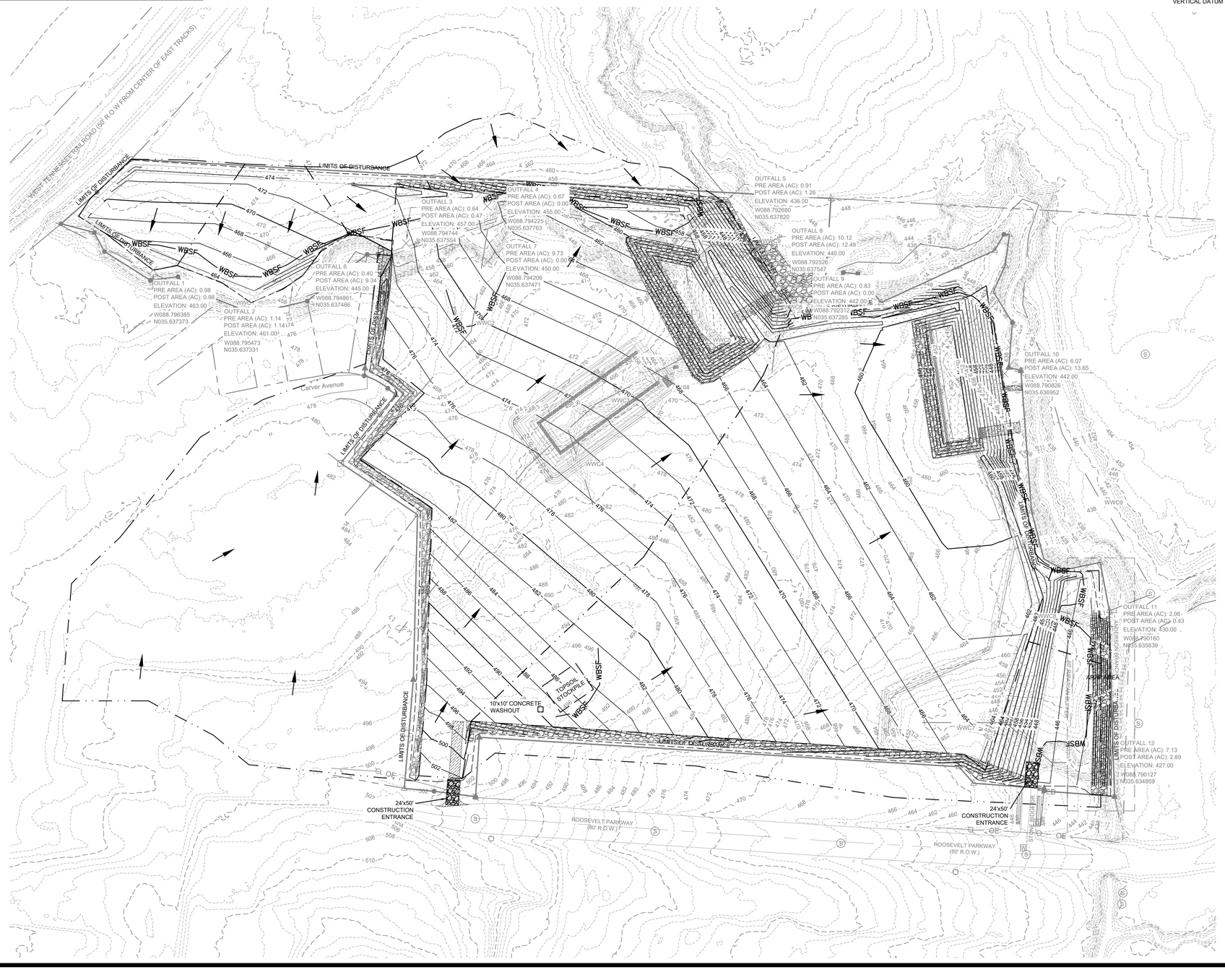
- EVERGREEN SHRUB

N

BEARING BASIS:
TENNESSEE STATE PLANE
COORDINATE SYSTEM - NAD 1983
VERTICAL DATUM - NAVD 1988



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SITE SPECIFIC EROSION CONTROL NOTES:

1. CONSTRUCT DETENTION POND AND STABILIZE WITH SOD (REF. C-900).
2. CONSTRUCT PERMANENT CONTAINMENT BERM TO DIRECT FLOW OF STORMWATER TO DETENTION POND 2 (REF. C-904).

SITE WILL BE BROUGHT UP TO GRADE DURING THIS PHASE. ANY AREAS THAT HAVE SEEN NO CONSTRUCTION ACTIVITY FOR 14 DAYS WILL BE STABILIZED WITH SEED AND STRAW MULCH.

DIVERSION BERM/DITCHES WILL BE MAINTAINED TO DIRECT STORMWATER RUNOFF TO SEDIMENT BASINS.

ARAP NOTES:

BANK STABILIZATION OF ANDERSON BRANCH WILL FOLLOW ALL THE GUIDANCE AND REGULATION OF THE TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION GENERAL AQUATIC RESOURCE ALTERATION PERMIT FOR BANK STABILIZATION.

BANK WILL BE STABILIZED WITH A MIN. OF 2.5' OF CLASS A-1 RIP RAP ON TOP OF GEOTEXTILE FABRIC.

FLOODPLAIN NOTE:

THE SITE IS LOCATED IN UNSHADED FLOOD ZONE "X", AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS DETERMINED BY THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP NO. 471130168E, DATED AUGUST 03, 2009.

GRAPHIC SCALE

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(IN FEET)
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REVISIONS

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L.I. SMITH REGISTERED ENGINEER — ASSOCIATES — STATE OF TENNESSEE

SHEET: E.P.S.C PHASE 3
NUMBER: C-402

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DRAWN BY: NTG	CHECKED BY: WPS	SCALE: 1"=100'
PROJECT # 201044		DATE: 01/15/2021

NRI000064

EROSION CONTROL LEGEND

- LIMITS OF CONSTRUCTION
- WBSF WBSF — WIRE BACKED SILT FENCE
- CHECK DAM
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- LANDSCAPING/SUITABLE COVER

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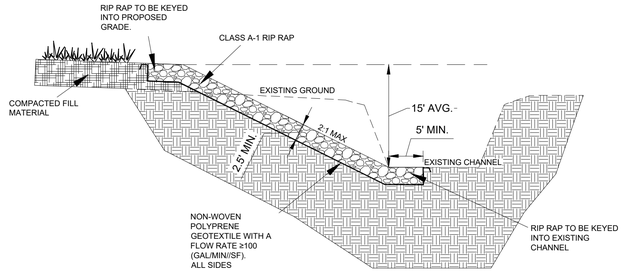
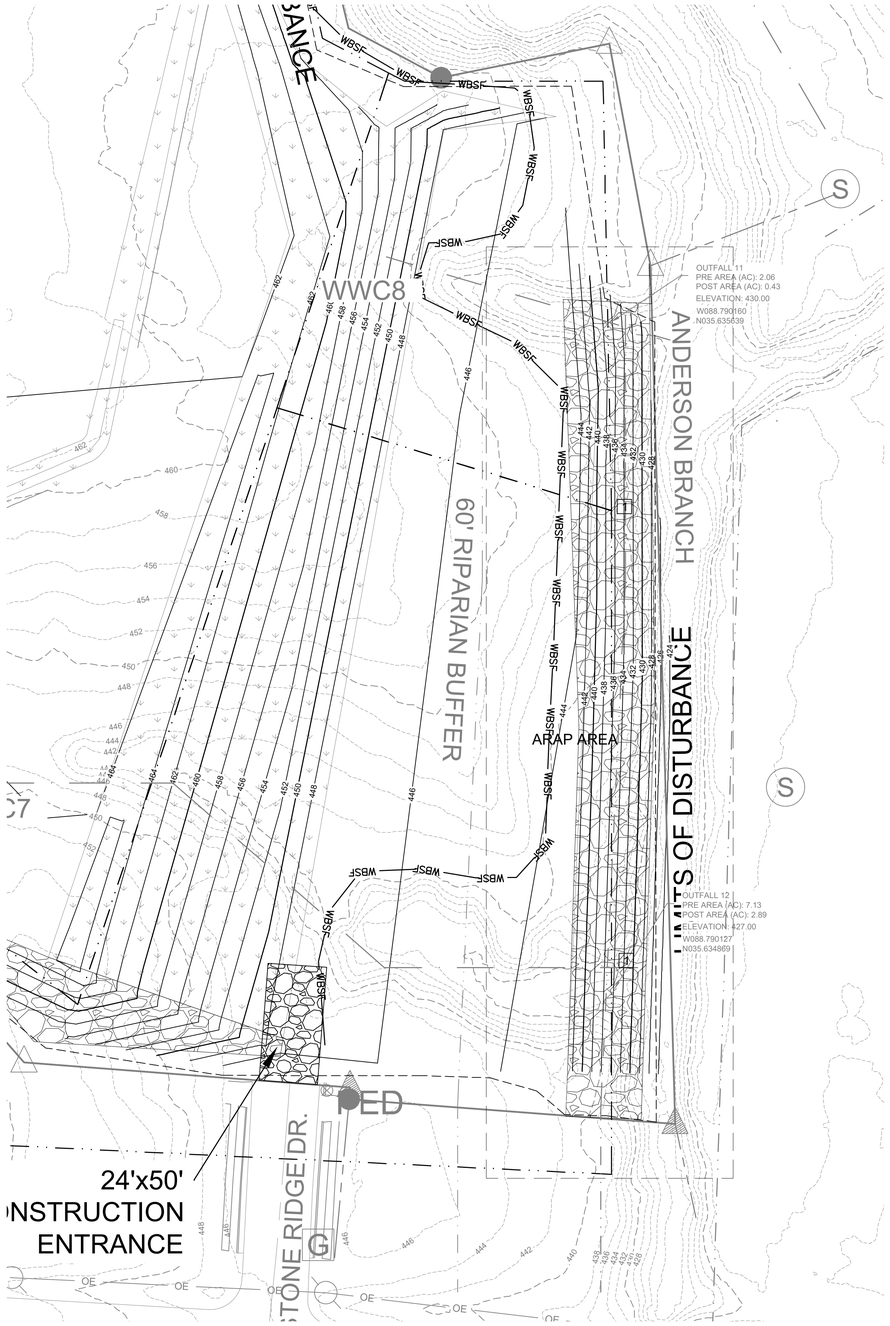
OUTFALL 4	35.637763	88.794225	455	0.67	0.00	ANDERSON BRANCH
OUTFALL 5	35.637675	88.792950	436	0.91	1.26	ANDERSON BRANCH
OUTFALL 6	35.637470	88.794722	445	0.40	9.34	ANDERSON BRANCH
OUTFALL 7	35.637471	88.794206	450	9.73	0.00	ANDERSON BRANCH
OUTFALL 8	35.637401	88.792955	440	10.12	12.49	ANDERSON BRANCH
OUTFALL 9	35.637285	88.792312	442	0.83	0.00	ANDERSON BRANCH
OUTFALL 10	35.636967	88.790871	442	6.07	13.65	ANDERSON BRANCH
OUTFALL 11	35.635639	88.790160	430	2.06	0.43	ANDERSON BRANCH
OUTFALL 12	35.634869	88.790127	427	7.13	2.89	ANDERSON BRANCH

NOTICE OF COVERAGE HAS BEEN ISSUED FOR A GENERAL CONSTRUCTION PERMIT AND ASSOCIATED GENERAL ARAP PERMIT THROUGH TDEC.

PERMITTED DISTURBANCE: 32 ACRES
TDEC PERMIT NUMBERS:
TNR 122460
NR 2102.014



4.12 *RIP RAP REVETMENT-BANK STABILZATION*
NO SCALE



LEGEND

N

BEARING BASIS:
TENNESSEE STATE PLANE
COORDINATE SYSTEM - NAD 1983
VERTICAL DATUM - NAVD 1988

- PROPERTY LINE
- PROPERTY ADJOINER LINE
- EASEMENT LINE (ESMT)
- CENTERLINE OF ROAD
- WATER LINE
- GAS LINE
- OVERHEAD UTILITY LINE
- SEWER LINE
- STORM DRAIN LINE
- OVERHEAD COMS LINE
- FLOW LINE
- DRAIN AREA LINE
- REBAR FOUND
- 5/8" REBAR WITH L.I. SMITH CAP SET
- UNMARKED POINT
- BENCHMARK
- CONCRETE SURFACE
- ASPHALT SURFACE
- GUY WIRE
- LIGHT POLE
- POWER POLE
- ELECTRICTRANSFORMER
- WATER METER
- WATER VALVE
- NATURAL GAS METER
- NATURAL GAS VALVE
- STORM MANHOLE
- CATCH BASIN
- CLEANOUT
- SIGN
- TELEPHONE PEDESTAL
- FIRE HYDRANT
- SEWER MANHOLE
- DECIDUOUS TREE
- EVERGREEN TREE
- EVERGREEN SHRUB

EROSION CONTROL NOTES:

1. NO TREES ARE TO BE REMOVED AND/OR VEGETATION DISTURBED EXCEPT AS NECESSARY FOR GRADING PURPOSES AND ONLY AS APPROVED BY OWNER'S REPRESENTATIVE AND TOWN ENGINEER.
2. TOPSOIL IS TO BE STRIPPED FROM ALL CUT AND FILL AREAS, STOCKPILED AND REDISTRIBUTED OVER GRADED AREAS TO A MINIMUM OF 6".
3. ALL GRADED AREAS, INCLUDING SLOPES, ARE TO BE STABILIZED AS SOON AS POSSIBLE AFTER GRADING IS COMPLETED, BUT NO LONGER THAN 14 DAYS LATER.
4. CONSTRUCT EROSION CONTROL AS SHOWN ON DRAWINGS PRIOR TO BEGINNING GRADING OPERATIONS.
5. ALL NEW STRUCTURES AND EXISTING STRUCTURES SHALL HAVE SEDIMENT REMOVED PRIOR TO ACCEPTANCE.
6. SILT BARRIERS SHALL BE CLEANED OF ACCUMULATED SEDIMENT WHEN APPROXIMATELY 33% FILLED WITH SUCH SEDIMENT.
7. ALL DIMENSIONS AND LOCATIONS OF TEMPORARY EROSION AND WATER POLLUTION CONTROL DEVICES SHALL BE SUBJECT TO ADJUSTMENT AS DESIGNATED BY THE OWNER'S REPRESENTATIVE AND TOWN ENGINEER.
8. WHEN THE TEMPORARY SOIL EROSION AND WATER POLLUTION DEVICES ARE NO LONGER REQUIRED FOR THE INTENDED PURPOSE IN THE OPINION OF THE OWNER'S REPRESENTATIVE AND TOWN ENGINEER, THEY SHALL BE REMOVED.
9. REPLACE SILT BARRIERS WHEN CONDITIONS WARRANT AND AS DIRECTED BY THE OWNER'S REPRESENTATIVE AND TOWN ENGINEER.
10. ALL SLOPES 3:1 OR STEEPER SHALL BE STABILIZED WITH EROSION CONTROL MATTING INSTALLED PER MANUFACTURERS' RECOMMENDATIONS, OR SOD.
11. ANY MUD/CONSTRUCTION DEBRIS THAT MAY BE TRANSPORTED TO SURROUNDING ROADS, OR OTHER SURROUNDING ROADS OR PARKING AREAS SHALL BE CLEANED UP IMMEDIATELY.
12. GENERAL CONTRACTOR SHALL KEEP GROUND DISTURBANCE TO THE MINIMUM REQUIRED TO COMPLETE THE PROJECT. ALL AREAS MUST BE TEMPORARILY OR PERMANENTLY STABILIZED IF DISTURBED AREA HAS NOT BEEN WORKED WITHIN THE PAST 14 DAYS.
13. SOD SHALL BE TURF TYPE TALL FESCUE.
14. TIME OF EXPOSURE OF UNPROTECTED SOILS SHALL BE KEPT TO A MAXIMUM PERIOD OF 7 DAYS. TEMPORARY STABILIZATION MEASURES, I.E. SEEDING & MULCHING, SHALL BE PERFORMED ON ANY UNPROTECTED AREA WHERE CONSTRUCTION OPERATIONS WILL CEASE FOR 7 OR MORE DAYS.
15. KEEP DUST WITHIN TOLERABLE LIMITS BY SPRINKLING OR OTHER ACCEPTABLE MEANS.
16. USE TEMPORARY VEGETATION AND/OR MULCH TO PROTECT BARE AREAS FROM EROSION DURING CONSTRUCTION.
17. NO OTHER WORK WILL BE INITIATED ON THE PROJECT UNTIL THE EROSION/SILTATION MEASURES SHOWN ON THE PLANS AND DETAILS ARE PROPERLY IN PLACE.
18. IF, AT ANY TIME DURING THE CONSTRUCTION PHASE OF THIS PROJECT, THE EROSION/SILTATION MEASURES INSTALLED FAIL TO FUNCTION PROPERLY, NEED MAINTENANCE OR REPAIR, OR NEED NEW REPLACEMENT IN ANY KIND, THE CONTRACTOR WILL EFFECT SUCH ACTIONS AS ARE NEEDED TO CORRECT THE SITUATION AT NO ADDITIONAL COST TO THE OWNER.
19. DISTURBED AREAS ARE TO BE GRADED TO DRAIN AS INDICATED ON PLAN TO SEDIMENT BARRIERS DURING AND UPON COMPLETION OF CONSTRUCTION.
20. ALL CUT/FILL AREAS TO BE LANDSCAPED OR THAT HAVE A VEGETATIVE COVER POST-CONSTRUCTION, SHALL HAVE A MINIMUM OF 6-INCH DEPTH TOPSOIL COVER. AREAS DRESSED WITH TOPSOIL SHALL BE SODDED AS SHOWN ON SHEET L1, LANDSCAPING PLAN.
21. UPON STABILIZATION OF THE PROJECT SITE WITH A GOOD (ACCEPTABLE) STAND OF GRASS AND/OR GROUND COVER, THE EROSION/SILTATION INSTALLATIONS WILL BE REMOVED AND THE AREA DISTURBED WILL BE SODDED AS OTHER NEW GRASSED AREAS OF THE PROJECT.

ARAP NOTES:

1. 300' OF STREAM BANK WILL BE CUT AT A 2:1 SLOPE AND STABILIZED WITH 2.5' MIN OF CLASS A-1 RIP RAP ON GEOTEXTILE FABRIC.

BANK STABILIZATION WILL ONLY BE PERFORMED WHEN THE CHANNEL IS DRY. NO WORK WILL BE ALLOWED IN THE CHANNEL WITHIN 72 HOURS OF A RAIN EVENT OF 0,1" OR GREATER.

BANK STABILIZATION OF ANDERSON BRANCH WILL FOLLOW ALL THE GUIDANCE AND REGULATION OF THE TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION GENERAL AQUATIC RESOURCE ALTERATION PERMIT FOR BANK STABILIZATION.

FLOODPLAIN NOTE:

THE SITE IS LOCATED IN UNSHADED FLOOD ZONE "X", AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS DETERMINED BY THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP NO. 471130168E, DATED AUGUST 03, 2009.

GRAPHIC SCALE

30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

COMMUNITY DEVELOPMENT ENTERPRISES
JACKSON SOLAR MICROGRID
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

REVISIONS

THIS DRAWING SHALL BE CONSIDERED PRELIMINARY IN NATURE AND, IN NO WAY, FINAL OR COMPLETE, UNLESS THE SEAL OF THE ENGINEER OR SURVEYOR OF RECORD IS AFFIXED HEREON.

SHEET: A.R.A.P.
NUMBER: C-403

L.I. Smith and Associates, Inc.
LAND DEVELOPMENT | INFRASTRUCTURE DESIGN
SURVEYING SERVICES
302 North Caldwell Street, Paris, TN 38242 | 731-644-1014 | www.lismith.com
475 Metroplex Drive, Suite 212 Nashville, TN 37211 | 615-256-0290

DRAWN BY: NTG | CHECKED BY: WPS | SCALE: 1"=30'
PROJECT # 201044 | DATE: 01/15/2021

NRI000065

EROSION CONTROL LEGEND

- - - - - - - -	LIMITS OF CONSTRUCTION
—— WBSF —— WBSF ——	WIRE BACKED SILT FENCE
△	CHECK DAM
☐	INLET PROTECTION
▨	LANDSCAPING/SUITABLE COVER

OUTFALL #	LATITUDE (N)	LONGITUDE (W)	APPROX. ELEV. (FEET)	PRE AREA (ACRES)	POST AREA (ACRES)	RECIEVING WATERS
OUTFALL 1	35.637373	88.796385	463	0.98	0.98	ANDERSON BRANCH
OUTFALL 2	35.637331	88.795473	461	1.14	1.14	ANDERSON BRANCH
OUTFALL 3	35.633755	88.794744	457	0.64	0.47	ANDERSON BRANCH
OUTFALL 4	35.637763	88.794225	455	0.67	0.00	ANDERSON BRANCH
OUTFALL 5	35.637675	88.792950	436	0.91	1.26	ANDERSON BRANCH
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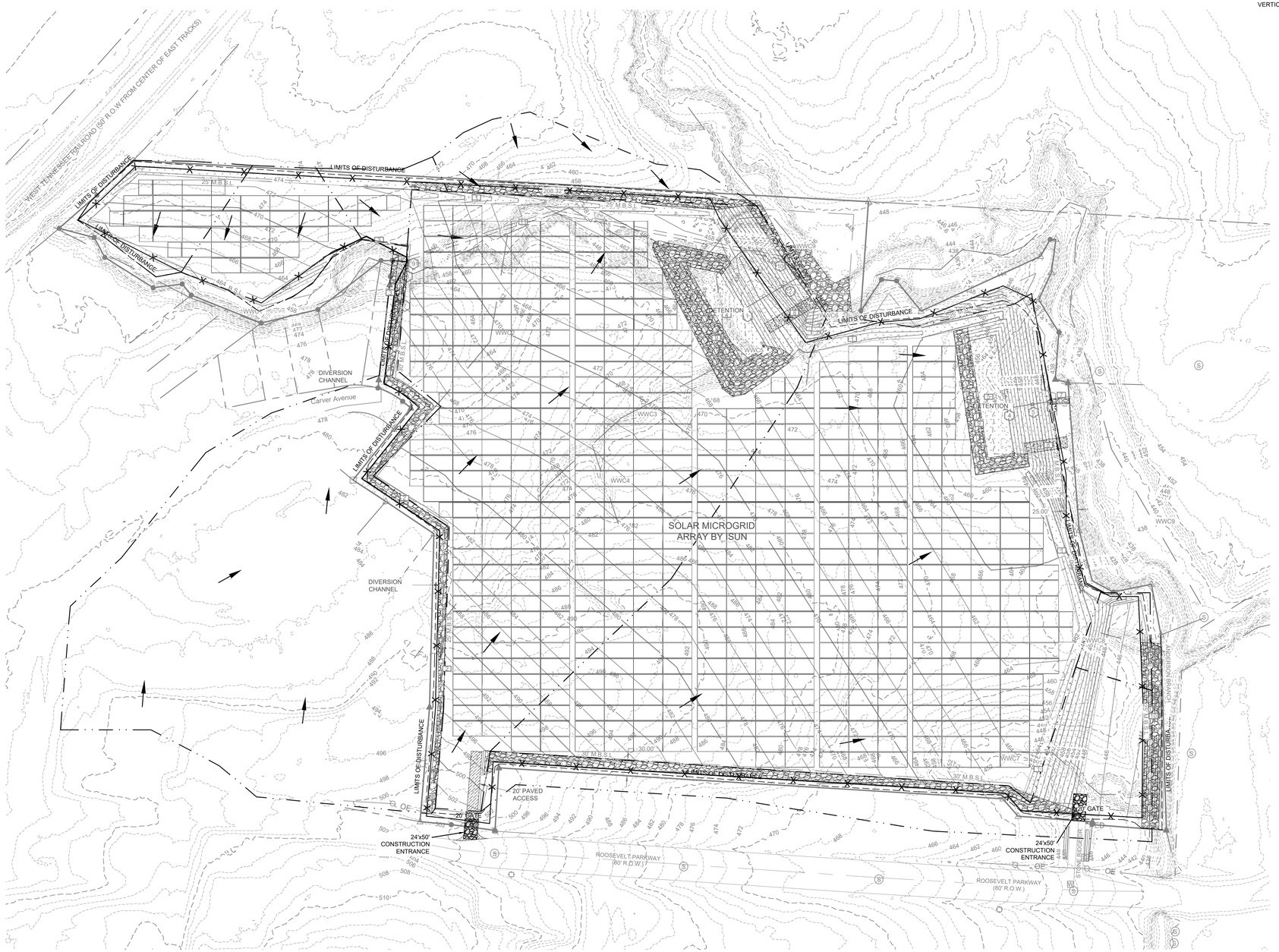
PERMITTED DISTURBANCE: 32 ACRES
TDEC PERMIT NUMBERS:
TNR 122460
NR 2102.014

N

BEARING BASIS:
TENNESSEE STATE PLANE
COORDINATE SYSTEM - NAD 1983
VERTICAL DATUM - NAVD 1988

LEGEND

▲——▲	PROPERTY LINE	→	GUY WIRE
— — — —	PROPERTY ADJOINER LINE	☼	LIGHT POLE
— — — —	EASEMENT LINE (ESMT)	○	POWER POLE
—— – ——	CENTERLINE OF ROAD	TR	ELECTRICTRANSFORMER
— W — W —	WATER LINE	W	WATER METER
— G — G —	GAS LINE	W	WATER VALVE
—— OE ——	OVERHEAD UTILITY LINE	G	NATURAL GAS METER
—— SS ——	SEWER LINE	G	NATURAL GAS VALVE
—— SD ——	STORM DRAIN LINE	SD	STORM MANHOLE
————	OVERHEAD COMS LINE	CB	CATCH BASIN
— · — · —	FLOW LINE	CO	CLEANOUT
— ·· — ·· —	DRAIN AREA LINE	●	SIGN
△	REBAR FOUND	PED	TELEPHONE PEDESTAL
▲	5/8" REBAR WITH L.I. SMITH CAP SET	☐	FIRE HYDRANT
●	UNMARKED POINT	S	SEWER MANHOLE
⊕	BENCHMARK	✿	DECIDUOUS TREE
☐	CONCRETE SURFACE	✳	EVERGREEN TREE
▨	ASPHALT SURFACE	⊙	EVERGREEN SHRUB



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3. ALL GRADED AREAS, INCLUDING SLOPES, ARE TO BE STABILIZED AS SOON AS POSSIBLE AFTER GRADING IS COMPLETED, BUT NO LONGER THAN 14 DAYS LATER.

4. CONSTRUCT EROSION CONTROL AS SHOWN ON DRAWINGS PRIOR TO BEGINNING GRADING OPERATIONS.

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21. UPON STABILIZATION OF THE PROJECT SITE WITH A GOOD (ACCEPTABLE) STAND OF GRASS AND/OR GROUND COVER, THE EROSION/SILTATION INSTALLATIONS WILL BE REMOVED AND THE AREA DISTURBED WILL BE SODDED AS OTHER NEW GRASSED AREAS OF THE PROJECT.

SITE SPECIFIC EROSION CONTROL NOTES:

1. CONTRACTOR TO SOD ALL DISTURBED AREAS NOT OTHERWISE STABILIZED WITH HARDSCAPE OR LANDSCAPING (TYP.)

FLOODPLAIN NOTE:

THE SITE IS LOCATED IN UNSHADED FLOOD ZONE "X", AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS DETERMINED BY THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP NO. 471130168E, DATED AUGUST 03, 2009.

GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

COMMUNITY DEVELOPMENT ENTERPRISES
JACKSON SOLAR MICROGRID
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

REVISIONS

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William P. I. Smith

SHEET: E.P.S.C PHASE 4
NUMBER: C-404

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SURVEYING SERVICES
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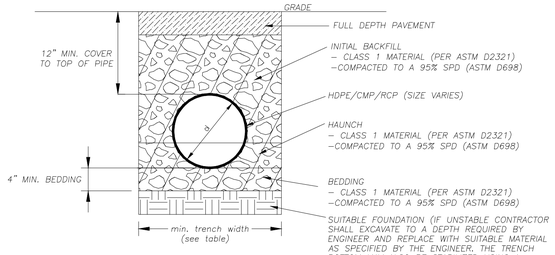
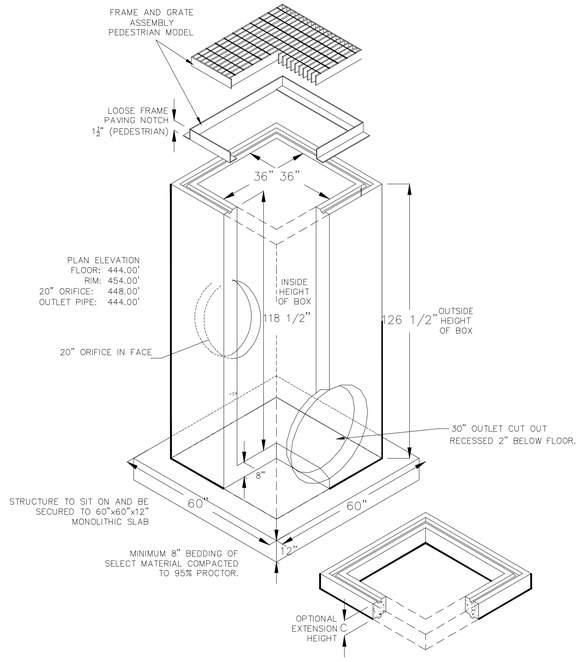
DRAWN BY: NTG
CHECKED BY: WPS
SCALE: 1"=100'
PROJECT # 201044
DATE: 01/15/2021



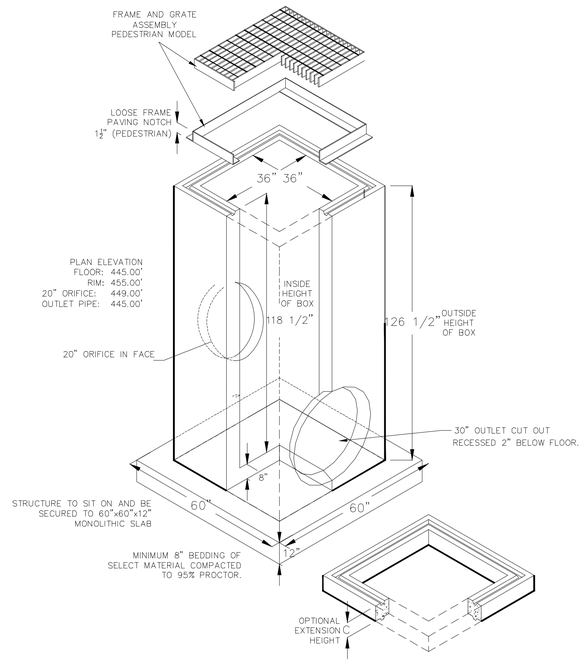
PIPE DIAMETER	MIN. TRENCH WIDTH
8" or smaller	26"
10"	32"
12"	36"
15"	39"
18"	46"
24"	54"
36"	70"

NOTE:
TRENCH WIDTHS, BEDDING MATERIALS AND COMPACTION REQUIREMENTS DEPICTED ARE MINUMUMS. CONTRACTOR SHALL INSTALL ALL PIPING PER MANUFACTURER'S WRITTEN INSTRUCTIONS OR ASTM D2321, UNLESS THESE DRAWINGS OR THE PROJECT SPECIFICATIONS ARE MORE STRINGENT.

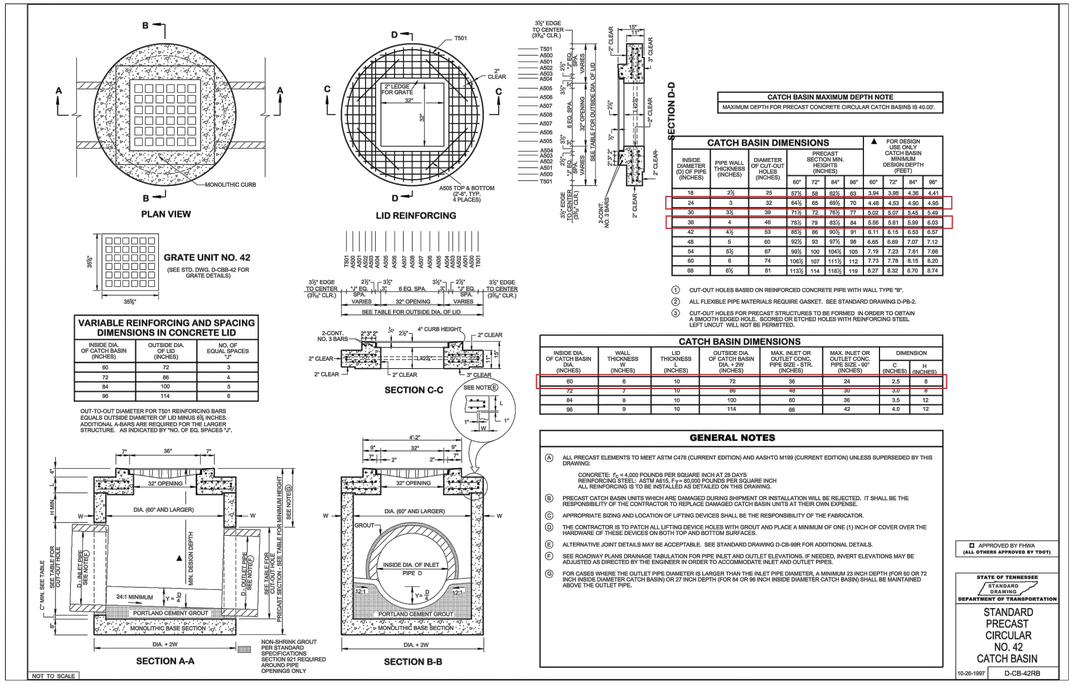
3.01 DRAINAGE PIPE TRENCH DETAIL
NO SCALE



3.02 DETENTION POND 1 OUTLET STRUCTURE
NO SCALE



3.03 DETENTION POND 2 OUTLET STRUCTURE
NO SCALE



CATCH BASIN MAXIMUM DEPTH NOTE
MAXIMUM DEPTH FOR PRECAST CONCRETE CIRCULAR CATCH BASINS IS 40.00'.

CATCH BASIN DIMENSIONS

INSIDE DIAMETER (ID) OF PIPE (INCHES)	PIPE WALL THICKNESS (INCHES)	DIAMETER OF CUT-OUT HOLES (INCHES)	PRECAST SECTION MIN. HEIGHTS (INCHES)			▲ FOR DESIGN USE ONLY CATCH BASIN MINIMUM DESIGN DEPTH (FEET)			
			60"	72"	84"	96"	60"	72"	84"	96"
18	2½	25	57½	58	63½	83	3.94	3.98	4.36	4.41
24	3	32	84½	65	69½	70	4.48	4.83	4.80	4.85
30	3½	39	71½	72	76½	77	5.02	5.07	5.45	5.49
36	4	46	78½	79	83½	84	5.56	5.61	5.99	6.03
42	4½	53	85½	86	90½	91	6.11	6.15	6.53	6.57
48	5	60	92½	93	97½	98	6.65	6.69	7.07	7.12
54	5½	67	99½	100	104½	105	7.19	7.23	7.61	7.66
60	6	74	106½	107	111½	112	7.73	7.78	8.15	8.20
66	6½	81	113½	114	118½	119	8.27	8.32	8.70	8.74

① CUT-OUT HOLES BASED ON REINFORCED CONCRETE PIPE WITH WALL TYPE "B".
② ALL FLEXIBLE PIPE MATERIALS REQUIRE GASKET. SEE STANDARD DRAWING D-PB-2.
③ CUT-OUT HOLES FOR PRECAST STRUCTURES TO BE FORMED IN ORDER TO OBTAIN A SMOOTH EDGED HOLE. SCORED OR STITCHED HOLES WITH REINFORCING STEEL, LEFT UNCUT WILL NOT BE PERMITTED.

VARIABLE REINFORCING AND SPACING DIMENSIONS IN CONCRETE LID

INSIDE DIA. OF CATCH BASIN (INCHES)	OUTSIDE DIA. OF LID (INCHES)	NO. OF EQUAL SPACES "J"
60	72	3
72	86	4
84	100	5
96	114	6

OUT-TO-OUT DIAMETER FOR T501 REINFORCING BARS EQUALS OUTSIDE DIAMETER OF LID MINUS 6½ INCHES. ADDITIONAL A-BARS ARE REQUIRED FOR THE LARGER STRUCTURE. AS INDICATED BY "NO. OF EQ. SPACES "J".

CATCH BASIN DIMENSIONS

INSIDE DIA. OF CATCH BASIN (INCHES)	WALL THICKNESS (INCHES)	LID THICKNESS (INCHES)	OUTSIDE DIA. OF CATCH BASIN (INCHES)	MAX. INLET OR OUTLET CONC. PIPE SIZE (INCHES)	MAX. INLET OR OUTLET CMP OR PIPE SIZE (INCHES)	DIMENSION	
						C (INCHES)	H (INCHES)
60	6	10	72	36	24	2.5	8
72	7	10	86	48	30	3.0	8
84	8	10	100	60	36	3.5	12
96	9	10	114	66	42	4.0	12

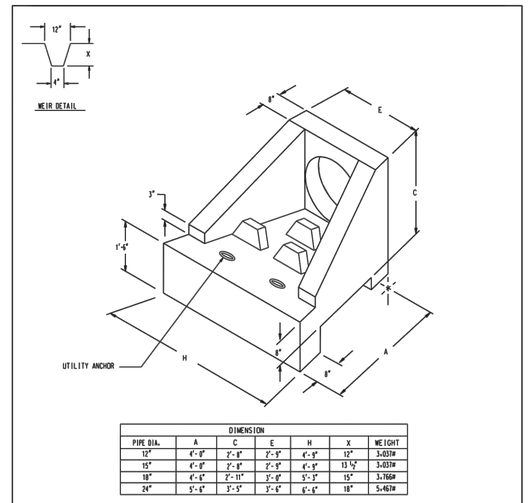
GENERAL NOTES

Ⓐ ALL PRECAST ELEMENTS TO MEET ASTM C478 (CURRENT EDITION) AND AASHTO M199 (CURRENT EDITION) UNLESS SUPERSEDED BY THIS DRAWING:
CONCRETE: f'_c = 4,000 POUNDS PER SQUARE INCH AT 28 DAYS
REINFORCING STEEL: ASTM A615, F_y = 60,000 POUNDS PER SQUARE INCH
ALL REINFORCING IS TO BE INSTALLED AS DETAILED ON THIS DRAWING.
Ⓑ PRECAST CATCH BASIN UNITS WHICH ARE DAMAGED DURING SHIPMENT OR INSTALLATION WILL BE REJECTED. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPLACE DAMAGED CATCH BASIN UNITS AT THEIR OWN EXPENSE.
Ⓒ APPROPRIATE SIZING AND LOCATION OF LIFTING DEVICES SHALL BE THE RESPONSIBILITY OF THE FABRICATOR.
Ⓓ THE CONTRACTOR IS TO PATCH ALL LIFTING DEVICE HOLES WITH GROUT AND PLACE A MINIMUM OF ONE (1) INCH OF COVER OVER THE HARDWARE OF THESE DEVICES ON BOTH TOP AND BOTTOM SURFACES.
Ⓔ ALTERNATIVE JOINT DETAILS MAY BE ACCEPTABLE. SEE STANDARD DRAWING D-CB-99R FOR ADDITIONAL DETAILS.
Ⓕ SEE ROADWAY PLANS DRAINAGE TABULATION FOR PIPE INLET AND OUTLET ELEVATIONS. IF NEEDED, INVERT ELEVATIONS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER IN ORDER TO ACCOMMODATE INLET AND OUTLET PIPES.
Ⓖ FOR CASES WHERE THE OUTLET PIPE DIAMETER IS LARGER THAN THE INLET PIPE DIAMETER, A MINIMUM 33 INCH DEPTH (FOR 60 OR 72 INCH INSIDE DIAMETER CATCH BASIN) OR 27 INCH DEPTH (FOR 84 OR 96 INCH INSIDE DIAMETER CATCH BASIN) SHALL BE MAINTAINED ABOVE THE OUTLET PIPE.

☐ APPROVED BY FHWA (ALL OTHERS APPROVED BY TDOT)

STATE OF TENNESSEE STANDARD DRAWING DEPARTMENT OF TRANSPORTATION
STANDARD PRECAST CIRCULAR NO. 42 CATCH BASIN
10-26-1997 D-CB-42RB

3.04 TYPE 42 DROP INLET
NO SCALE



DIMENSION						
PIPE DIA.	A	C	E	H	X	WEIGHT
12"	4'- 0"	2'- 8"	2'- 5"	4'- 5"	12"	3,037#
15"	4'- 0"	2'- 8"	2'- 5"	4'- 5"	13 ½"	3,037#
18"	4'- 6"	2'- 11"	3'- 0"	5'- 1"	15"	3,766#
24"	5'- 6"	3'- 5"	3'- 6"	6'- 6"	18"	5,467#

GENERAL NOTES:
1. 2" MIN. CONCRETE COVERAGE.
2. REIF. - #4 REBAR 12" C.C. EA. WAY.
3. HOLE SIZE = PIPE O.D. + 3".
4. ¾" CHAMFER OR ROUND ON ALL EXPOSED EDGES.

ENERGY DISSIPATOR BLOCK 12"- 27" PIPE | SCALE: NTS

FORTERRA
PH• 1-800-737-0707 | DWG# ET-230
DATE:01/23/12 | SHEET# 1 OF 1

3.05 HEADWALL WITH ENERGY DISSIPATOR
NO SCALE

COMMUNITY DEVELOPMENT ENTERPRISES
JACKSON SOLAR MICROGRID
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

REVISIONS

THIS DRAWING SHALL BE CONSIDERED PRELIMINARY IN NATURE AND, IN NO WAY, FINAL OR COMPLETE, UNLESS THE SEAL OF THE ENGINEER OR SURVEYOR OF RECORD IS AFFIXED HEREON.

P. L. Smith — REGISTERED ENGINEER — 103333 — STATE OF TENNESSEE — 01/15/2021

SHEET: SITE DETAILS
NUMBER: C-900

L.I. Smith and Associates, Inc.
LAND DEVELOPMENT | INFRASTRUCTURE DESIGN
SURVEYING SERVICES
302 North Caldwell Street, Paris, TN 38242 ▫ 731-644-1014 ▫ www.lismith.com
475 Metroplex Drive, Suite 212 Nashville, TN 37211 ▫ 615-256-0290

DRAWN BY: NTG | CHECKED BY: WPS | SCALE: | DATE: 01/15/2021
PROJECT # 201044

NRI000067

STD-17-S2403-BARREL_BOXY.DGN

1 @ 8 x 6 REINFORCED CONCRETE BOX BRIDGE

Maximum Fill Height ft	Dimensions ST in.	SB in.	WT in.	BW ft.	Bars TST Size	No.	Spacing in.	Length ft.	Bars TSB Size	No.	Spacing in.	Length ft.	Bars BST Size	No.	Spacing in.	Length ft.	Bars BSB Size	No.	Spacing in.	Length ft.	Bars EWE Size	No.	Spacing in.	Length ft.	Bars LNT No.	Bars LND No.	Bars WS No.	Concrete CY/LF	Reinf. Steel LB/LF
No Fill	9.5	9	8	9.33	4	1	12	8.83	6	2	6	8.83	8	1	12	9.83	4	1	12	9.83	4	2	12	6.00	54	16	4	0.89	192
3	11	11	8	9.33	4	1	12	8.83	7	2	6	8.83	8	1	12	9.83	4	1	12	9.83	4	2	12	6.00	54	16	4	0.89	202
5	9	9	8	9.33	4	1	12	8.83	7	2	6	8.83	8	2	6	9.83	4	1	12	9.83	4	2	12	6.00	62	0	4	0.84	193
10	9	9	8	9.33	4	1	12	8.83	8	2	6	8.83	8	1	12	9.83	4	1	12	9.83	4	2	12	6.00	62	0	4	0.84	201
20	10	11	8	9.33	4	1	12	8.83	7	2	6	8.83	7	2	6	9.83	4	1	12	9.83	4	2	12	6.00	62	0	4	0.94	210
30	14	15	9	9.83	4	1	12	9.00	7	2	6	9.00	9	1	12	10.00	4	1	12	10.00	4	2	12	6.00	62	0	4	1.33	299
40	16	18	10	9.67	4	1	12	9.17	7	2	6	9.17	9	1	12	10.17	4	1	12	10.17	4	2	12	6.00	62	0	4	1.70	309
50	21	21	11	9.83	4	1	12	9.33	7	2	6	9.33	7	2	6	10.33	4	1	12	10.33	4	2	12	6.00	62	0	4	2.00	313
60	24	24	12	10.00	4	1	12	9.50	7	2	6	9.50	7	2	6	10.50	4	1	12	10.50	4	2	12	6.00	62	0	4	2.00	313

1 @ 8 x 7 REINFORCED CONCRETE BOX BRIDGE

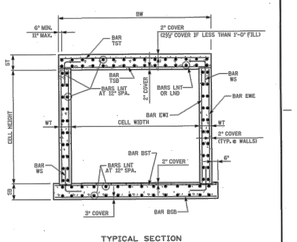
Maximum Fill Height ft	Dimensions ST in.	SB in.	WT in.	BW ft.	Bars TST Size	No.	Spacing in.	Length ft.	Bars TSB Size	No.	Spacing in.	Length ft.	Bars BST Size	No.	Spacing in.	Length ft.	Bars BSB Size	No.	Spacing in.	Length ft.	Bars EWE Size	No.	Spacing in.	Length ft.	Bars LNT No.	Bars LND No.	Bars WS No.	Concrete CY/LF	Reinf. Steel LB/LF
No Fill	9.5	9	8	9.33	4	1	12	8.83	6	2	6	8.83	8	1	12	9.83	4	1	12	9.83	4	2	12	7.00	54	16	4	0.91	198
3	11	11	8	9.33	4	1	12	8.83	7	2	6	8.83	8	1	12	9.83	4	1	12	9.83	4	2	12	7.00	54	16	4	1.01	208
5	9	9	8	9.33	4	1	12	8.83	7	2	6	8.83	8	2	6	9.83	4	1	12	9.83	4	2	12	7.00	62	0	4	0.89	200
10	9	9	8	9.33	4	1	12	8.83	8	2	6	8.83	8	1	12	9.83	4	1	12	9.83	4	2	12	7.00	62	0	4	0.89	217
20	10	11	8	9.33	4	1	12	8.83	7	2	6	8.83	7	2	6	9.83	4	1	12	9.83	4	2	12	7.00	62	0	4	0.98	224
30	14	16	10	9.67	4	1	12	9.17	7	2	6	9.17	9	2	6	10.17	4	1	12	10.17	4	2	12	7.00	62	0	4	1.38	217
40	18	19	11	9.83	4	1	12	9.33	7	2	6	9.33	9	1	12	10.33	4	1	12	10.33	4	2	12	7.00	62	0	4	1.66	222
50	21	21	12	10.00	4	1	12	9.50	7	2	6	9.50	7	2	6	10.50	4	1	12	10.50	4	2	12	7.00	70	0	4	1.98	233
60	24	24	13	10.17	4	1	12	9.67	7	2	6	9.67	7	2	6	10.67	4	1	12	10.67	4	2	12	7.00	70	0	4	2.14	235

1 @ 8 x 8 REINFORCED CONCRETE BOX BRIDGE

Maximum Fill Height ft	Dimensions ST in.	SB in.	WT in.	BW ft.	Bars TST Size	No.	Spacing in.	Length ft.	Bars TSB Size	No.	Spacing in.	Length ft.	Bars BST Size	No.	Spacing in.	Length ft.	Bars BSB Size	No.	Spacing in.	Length ft.	Bars EWE Size	No.	Spacing in.	Length ft.	Bars LNT No.	Bars LND No.	Bars WS No.	Concrete CY/LF	Reinf. Steel LB/LF
No Fill	8.5	9	8	9.33	4	1	12	8.83	6	2	6	8.83	8	1	12	9.83	8	1	12	9.83	4	2	12	8.00	52	16	4	0.98	224
3	11	11	8	9.33	4	1	12	8.83	7	2	6	8.83	8	1	12	9.83	4	1	12	9.83	4	2	12	8.00	52	16	4	1.06	214
5	9	9	8	9.33	4	1	12	8.83	7	2	6	8.83	8	2	6	9.83	4	1	12	9.83	4	2	12	8.00	70	0	4	0.94	206
10	9	9	8	9.33	4	1	12	8.83	8	2	6	8.83	8	1	12	9.83	4	1	12	9.83	4	2	12	8.00	70	0	4	0.94	233
20	10	12	8	9.50	4	1	12	9.00	7	2	6	9.00	9	1	12	10.00	4	1	12	10.00	4	2	12	8.00	70	0	4	1.33	242
30	14	16	11	9.83	4	1	12	9.33	7	2	6	9.33	9	1	12	10.33	4	1	12	10.33	4	2	12	8.00	70	0	4	1.59	245
40	18	19	12	10.00	4	1	12	9.50	7	2	6	9.50	9	1	12	10.50	4	1	12	10.50	4	2	12	8.00	74	0	4	1.79	249
50	21	21	14	10.33	4	1	12	9.83	7	2	6	9.83	7	2	6	10.83	4	1	12	10.83	4	2	12	8.00	74	0	4	2.10	392
60	24	24	16	10.50	4	1	12	10.00	7	2	6	10.00	7	2	6	11.00	4	1	12	11.00	4	2	12	8.00	74	0	4	2.37	391

Note: Maximum fill height shown in the table is measured from the bottom of the top slab. To obtain the total fill height from the floor line, add the height of the box.
Note: When height of fill above the top slab is less than 1 foot, the top mat of reinforcing in the top slab shall be constructed with 2-1/2 inches of concrete cover.

The following bar information applies to all fill cases in the tables above:
Bars LNT Size = 4 Spacing = 12 in.
Bars LND Size = 5 Spacing = 6 in.
Bars WS Size = 8 Length = 8.00 ft. Spacing = 12 in.



TYPICAL SECTION

NOTE: FOR DESCRIPTIONS OF BOX DIMENSIONS AND REINFORCING BAR DESIGNATIONS SEE STANDARD DRAWING NO. STD-17-1.

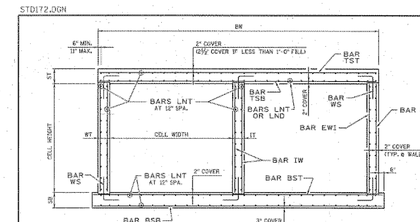
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
STANDARD REINFORCED CONCRETE BOX BRIDGE
INTERIOR SECTION
SPANS: 1 BARREL AT 8'-0"
CLEAR HEIGHTS 6'-0" THRU 8'-0"
0' THRU 60' FILL
2010

CORRECT Edward P. Wasserman
CHIEF ENGINEER OF OPERATIONS

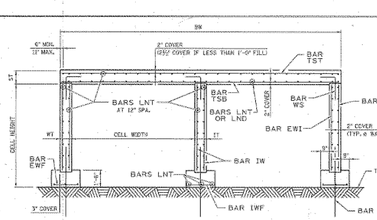
STD-17-S3

DESIGNED BY: BILL GILLY — DATE: 12-09
DRAWN BY: KENTA MATSUMO — DATE: 12-09
SUPERVISED BY: TOM WHITE — DATE: 12-09
CHECKED BY: BILL GILLY — DATE: 12-09

STD172.DGN



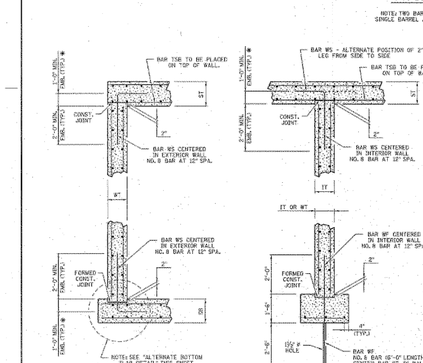
BOX BRIDGE



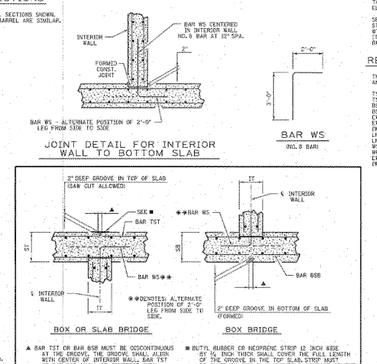
SLAB BRIDGE

TYPICAL SECTIONS

NOTE: TWO BARREL TYPICAL SECTIONS SHOWN. SINGLE BARREL AND THREE BARREL SIMILAR.



JOINT DETAIL FOR WALL TO SLAB OR FOOTING



JOINT DETAIL FOR INTERIOR WALL TO BOTTOM SLAB

BOX OR SLAB BRIDGE

BOX BRIDGE

▲ BAR TST OR BAR BSB MUST BE DISCONTINUOUS AT THE GROOVE. THE GROOVE SHALL ALIGN WITH CENTER OF INTERIOR WALL. BAR TST OR BAR BSB SHALL BE CENTERED WITH RESPECT TO THE CELL WIDTH.

✱ BUTYL RUBBER OR NEOPRENE STRIP 12 INCH WIDE BY ½ INCH THICK SHALL COVER THE FULL LENGTH OF THE GROOVE IN THE TOP SLAB. STRIP MUST BE GLUED TO THE SLAB UTILIZING CONTACT CEMENT OVER 100% OF THE CONTACT AREA.

✱✱ DENOTES ALTERNATE POSITION OF 2'-0" LEG FROM SIDE TO SIDE.

MOMENT BREAK DETAIL FOR MULTIPLE BARREL BOX & SLAB BRIDGES

NOTE: MANDATORY FOR FILL HEIGHTS GREATER THAN 10 FEET.

BOX DIMENSION DESIGNATIONS

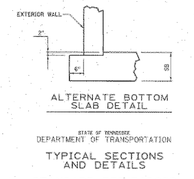
THE BOX DIMENSION DESIGNATIONS IDENTIFY THE BOX ELEMENTS AS FOLLOWS:

SB = BOTTOM SLAB THICKNESS
ST = TOP SLAB THICKNESS
WT = EXTERIOR WALL THICKNESS
IT = INTERIOR WALL THICKNESS
BW = BOX WIDTH

REINFORCING BAR DESIGNATIONS

THE REINFORCING BAR DESIGNATIONS IDENTIFY THE LOCATION AND PLACEMENT OF THE BARS AS FOLLOWS:

TST = TOP SLAB, TOP FACE
TSB = TOP SLAB, BOTTOM FACE
BST = BOTTOM SLAB, TOP FACE
BSB = BOTTOM SLAB, BOTTOM FACE
EWE = EXTERIOR WALL, EXTERIOR FACE
EWI = EXTERIOR WALL, INTERIOR FACE
IW = INTERIOR WALL, BOTH FACES
LNT = LONGITUDINAL BAR
LND = LONGITUDINAL DISTRIBUTION BAR, TOP SLAB, BOTTOM FACE
WS = WING WALL TO SLAB
WF = CONNECTION WALL TO FOOTING
EWF = EXTERIOR WALL FOOTING
IWF = INTERIOR WALL FOOTING



ALTERNATE BOTTOM SLAB DETAIL

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
TYPICAL SECTIONS AND DETAILS
STANDARD REINFORCED CONCRETE BRIDGE BOX AND SLAB TYPE
2010

CORRECT Edward P. Wasserman
CHIEF ENGINEER OF OPERATIONS

STD-17-S

CONST. NO.

PROJECT NO.	YEAR	SHEET NO.
	2010	

REVISIONS

NO.	DATE	BY	BRIEF DESCRIPTION

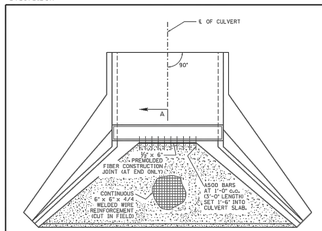
CONST. NO.

PROJECT NO.	YEAR	SHEET NO.
	2010	

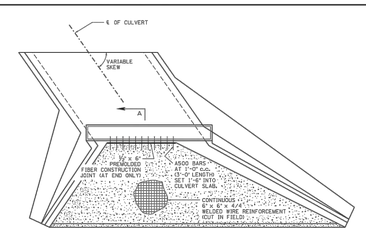
REVISIONS

NO.	DATE	BY	BRIEF DESCRIPTION

STD175.DGN



PLAN VIEW FOR BOX CULVERTS ON 90 DEGREE SKEW TO CENTERLINE



PLAN VIEW FOR BOX CULVERTS ON VARIABLE DEGREE SKEW TO CENTERLINE

REVISIONS			
NO.	DATE	BY	BRIEF DESCRIPTION
M/R	8.1	4/01/19	AP REVISED ASTM SPECIFICATION NUMBER

M/R DENOTES MINOR REVISION, FHWA APPROVAL NOT REQUIRED.

GENERAL NOTES

① PAVED OUTLET DETAIL IS TO BE USED ONLY WHEN SPECIFIED IN DESIGN PLANS.

② CONCRETE PAVED OUTLETS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, SECTIONS 204 AND 604 OR CURRENT SPECIAL PROVISIONS.

CONCRETE: CLASS "A", f'_c = 3000 PSI MINIMUM AT 28 DAYS.

REINFORCING STEEL: ASTM A615 GRADE 60

WELDED WIRE REINFORCEMENT: DETAILS AND PLACEMENT TO CONFORM TO CURRENT CMS1 STANDARDS. THE MATERIALS TO CONFORM TO ASTM A1064. ⚠

FOUNDATION FILL MATERIALS TO BE SAME AS THAT DESIGNED BY THE STANDARD SPECIFICATIONS FOR USE UNDER THE PROPOSED CONCRETE BOX CULVERT.

FORMS AND FINISH TO CONFORM TO STANDARD SPECIFICATIONS.

③ CONCRETE JOINT MATERIAL IS TO BE ½" x 6" PREMOLDED FIBER IN ACCORDANCE WITH SECTION 905 - JOINT MATERIALS OF THE STANDARD SPECIFICATIONS, COST IS TO BE INCLUDED IN THE UNIT PRICE BID FOR CLASS "A" CONCRETE (BOX BRIDGES).

④ PAYMENT WILL BE MADE AS FOLLOWS:

FOUNDATION FILL MATERIAL PER CUBIC YARD.
CLASS "A" CONCRETE (BOX BRIDGES) PER CUBIC YARD.
STEEL BAR REINFORCEMENT (BOX BRIDGES) PER POUND.

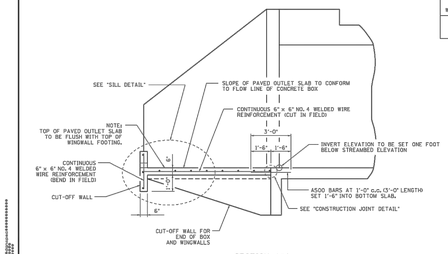
NOTES:

① WELDED WIRE REINFORCEMENT: TO BE 6" x 6" NO. 4 GAUGE WELDED WIRE AT 58 LBS./100 SQ.FT. WITH 9" MINIMUM LAP. WIRE TO CONFORM TO ASTM A1064 SPECIFICATIONS, THE WIRE IS TO EXTEND TO WITHIN 3" OF THE EDGE OF THE SLAB AND SHALL BE PLACED AT ONE HALF THE DEPTH OF THE SLAB. ⚠

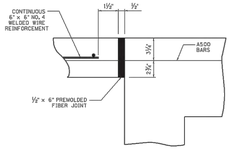
② THE CONTRACTOR MAY SUBSTITUTE AN EQUIVALENT AREA OF ASTM NUMBER 3 REINFORCING BARS FOR THE 6" x 6" NO. 4 WELDED WIRE REINFORCEMENT.

ESTIMATED QUANTITIES

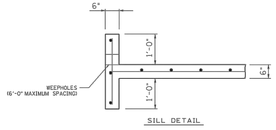
6" x 6" NO. 4 GAUGE WELDED WIRE REINFORCEMENT	REINFORCING STEEL (A500 BARS)	CONCRETE CLASS "A" SLAB	CONCRETE CLASS "A" CUT-OFF WALL	CONCRETE CLASS "A" SILL
58 LBS./100 SQ.FT.	3.130 LBS. PER A500 BAR	0.019 C.Y. PER SQ.FT.	0.019 C.Y. PER LIN.FT.	0.019 C.Y. PER LIN.FT.



SECTION A-A



CONSTRUCTION JOINT DETAIL



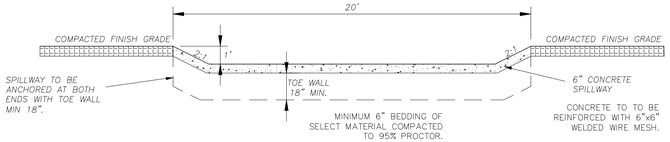
SILL DETAIL

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
PAVED OUTLET DETAIL
STANDARD REINFORCED CONCRETE BRIDGE BOX TYPE
2010

CORRECT Edward P. Wasserman
CHIEF ENGINEER OF OPERATIONS

STD-17-19

DESIGNED BY: KENT C. MAH — DATE: 12-09
DRAWN BY: DEANE BUSH — DATE: 04-10
SUPERVISED BY: TOM C. WHITE / KENT C. MAH — DATE: 12-09
CHECKED BY: — DATE:



EMERGENCY SPILLWAY

NO SCALE

COMMUNITY DEVELOPMENT ENTERPRISES
JACKSON SOLAR MICROGRID
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

REVISIONS

THIS DRAWING SHALL BE CONSIDERED PRELIMINARY IN NATURE AND, IN NO WAY, FINAL OR COMPLETE, UNLESS THE SEAL OF THE ENGINEER OR SURVEYOR OF RECORD IS AFFIXED HEREON.

SHEET: SITE DETAILS
NUMBER: C-901

L.I. Smith and Associates, Inc.
LAND DEVELOPMENT | INFRASTRUCTURE DESIGN
SURVEYING SERVICES
302 North Caldwell Street, Paris, TN 38242 | 731-644-1014 | www.lismith.com
475 Metroplex Drive, Suite 212 Nashville, TN 37211 | 615-256-0290

DRAWN BY: NTG | CHECKED BY: WPS | SCALE:
PROJECT # 201044 | DATE: 01/15/2021

NRI000068

STD173.DGN

NOTE: SEE TABLES ON STANDARD DRAWINGS STD-17-11 THRU 14 FOR WINGWALL DIMENSIONS

ELEVATION VIEW OF WINGWALL

TYPICAL CORNER DETAIL

* = WINGWALL LENGTH FOR 90° SKEW
WL = LENGTH OF LONG WINGWALL FOR SKEWS OTHER THAN 90°
WS = LENGTH OF SHORT WINGWALL FOR SKEWS OTHER THAN 90°
H = HEIGHT AT BEGINNING OF WINGWALL
h = NON-HEIGHT OF END OF WINGWALL FOR 90° SKEW
hl = NON-HEIGHT OF END OF LONG WINGWALL FOR SKEWS OTHER THAN 90°
hs = NON-HEIGHT OF END OF SHORT WINGWALL FOR SKEWS OTHER THAN 90°

NOTES

1. WALL JOINTS - AN EXPANSION JOINT IS REQUIRED AT THE LOCATION SHOWN ON THIS DRAWING FOR ALL BOX BRIDGES, AND FOR SLAB BRIDGES WHENEVER THE WINGWALL LENGTH IS GREATER THAN 15 FEET. FOR WINGWALLS GREATER THAN 30 FEET, PLACE A CONTRACTION JOINT AT MID-LENGTH OF WINGWALL.
   IF INSTALLATION GROOVES ARE USED, THE JOINTS SHALL BE SPACED TO CORRESPOND WITH INSTIGATING. WATERSTOPS SHALL MEET THE REQUIREMENTS OF SPECIFICATION ARTICLES 604-26 AND 916.11. JOINT MATERIAL SHALL MEET THE REQUIREMENTS OF SPECIFICATION ARTICLE 916.02. BOX, FOOTING AND FOOTING REINFORCEMENT SHALL BE CONTINUOUS.

NOTE: STOP KEY 1'-0" BELOW TOP OF WALL

CONTRACTION JOINT

▲ DENOTES ¾ THICKNESS FOR 9" HOLLOW BULB TYPE RUBBER OR PLASTIC WATERSTOP

EXPANSION JOINT DETAIL

d DENOTES WIDTH OF WINGWALL

● DENOTES HOLLOW BULB TYPE RUBBER OR PLASTIC WATERSTOP

TYPICAL KEY DETAIL

THE EXPANSION JOINT SHALL BE USED IN THE WALL ONLY AND NOT CARRIED THROUGH THE FOOTING. NO REINFORCEMENT SHALL PASS THROUGH THE JOINT. ONE END OF THE DOWELS SHALL BE WRAPPED IN A LAYER OF TARPAPER WITH A TARPAPER CAP OVER THE END. THE COST OF THE BITUMINOUS FIBER AND DOWEL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CLASS A CONCRETE.

WALL JOINT DETAILS

NOTE: USE RIP-RAP OR PAVED OUTLET AT ENDS OF BOX AND SLAB BRIDGES AS SPECIFIED ON THE ROADWAY PLANS.

PLAN VIEW OF WINGWALLS

180° SKEW SHOWN, OTHER SKEWS SIMILAR

CONST. NO.		
PROJECT NO.	YEAR 2010	SHEET NO.
REVISIONS		
NO.	DATE	BY
		BRIEF DESCRIPTION

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

TYPICAL WINGWALL DETAILS AND NOTES

STANDARD REINFORCED CONCRETE BRIDGE BOX AND SLAB TYPE

2010

CORRECT Edward P. Wasserman
DIRECTOR OF STRUCTURES

STD-17-10

STD174.DGN

45° SKEW

2:1 SLOPE

H	WL	hl	WS	hs	CONCRETE (C.Y.)	REINF. STEEL (LBS.)
4	9,75	2,50	4,50	1,75	4,9	720
4,5	11,00	2,75	5,00	1,75	5,9	782
5	12,25	3,25	5,50	2,00	7,6	896
5,5	13,75	3,50	6,25	2,25	9,1	1,067
6	15,00	3,75	6,75	2,50	10,6	1,173
6,5	16,25	4,25	7,25	2,75	12,2	1,242
7	17,75	4,50	8,00	3,00	14,1	1,614
7,5	19,00	4,75	8,50	3,00	16,4	1,731
8	20,25	5,25	9,00	3,25	19,1	1,678
8,5	21,50	5,50	9,75	3,50	21,3	2,050
9	23,00	5,75	10,25	3,75	24,6	3,137
9,5	24,25	6,25	10,75	4,00	27,3	3,253
10	25,50	6,50	11,50	4,00	29,9	3,573
10,5	26,75	6,75	12,00	4,25	32,6	3,756
11	28,25	7,25	12,50	4,50	37,7	4,237
11,5	29,50	7,50	13,25	4,75	42,4	5,191
12	30,75	7,75	13,75	5,00	46,1	5,066
12,5	32,25	8,25	14,25	5,25	50,2	5,730
13	33,50	8,50	15,00	5,25	57,0	6,763
13,5	34,75	8,75	15,50	5,50	60,9	7,336
14	36,00	9,00	16,00	5,75	66,2	7,741
14,5	37,50	9,50	16,75	6,00	71,5	8,221
15	38,75	9,75	17,25	6,25	83,1	8,868
15,5	40,00	10,00	17,75	6,50	84,8	9,888
16	41,25	10,50	18,50	6,50	90,3	10,387
16,5	42,75	10,75	19,00	6,75	95,9	10,229
17	44,00	11,00	19,75	7,00	109,5	13,789
17,5	45,25	11,50	20,25	7,25	115,7	13,669
18	46,75	11,75	20,75	7,50	122,1	14,265
18,5	48,00	12,00	21,50	7,75	128,6	14,503
19	49,25	12,50	22,00	7,75	143,7	15,966
19,5	50,50	12,75	22,50	8,00	148,4	18,028
20	52,00	13,00	23,25	8,25	161,3	19,025
20,5	53,25	13,50	23,75	8,50	169,1	19,298
21	54,50	13,75	24,25	8,75	189,1	21,559

3:1 SLOPE

H	WL	hl	WS	hs	CONCRETE (C.Y.)	REINF. STEEL (LBS.)
4	11,25	3,00	5,50	2,00	6,0	765
4,5	12,75	3,25	6,25	2,25	7,3	845
5	14,25	3,75	7,00	2,50	9,4	967
5,5	15,75	4,00	7,75	2,75	11,1	1,067
6	17,25	4,50	8,50	3,00	13,0	1,173
6,5	18,75	4,75	9,25	3,25	14,9	1,376
7	20,25	5,25	10,00	3,50	18,4	1,728
7,5	21,75	5,50	10,75	3,75	20,8	1,935
8	23,25	6,00	11,50	4,00	22,9	2,021
8,5	24,75	6,25	12,25	4,50	26,2	2,302
9	26,25	6,75	13,00	4,75	30,4	3,505
9,5	27,75	7,00	13,50	5,00	34,3	3,703
10	29,25	7,50	14,25	5,25	37,8	4,078
10,5	30,75	7,75	15,00	5,50	41,3	4,239
11	32,25	8,25	15,75	5,75	46,6	4,785
11,5	33,50	8,50	16,50	6,00	51,9	5,807
12	35,00	8,75	17,25	6,25	56,1	6,256
12,5	36,50	9,25	18,00	6,50	61,9	6,564
13	38,00	9,50	18,75	6,75	70,3	7,629
13,5	39,50	10,00	19,50	7,00	76,2	8,259
14	41,00	10,25	20,25	7,25	83,5	8,673
14,5	42,50	10,75	21,00	7,50	87,3	9,189
15	44,00	11,00	21,50	7,75	103,3	10,056
15,5	45,50	11,50	22,25	8,00	107,9	11,271
16	47,00	11,75	23,00	8,25	114,3	11,398
16,5	48,50	12,25	23,75	8,50	121,4	14,121
17	50,00	12,50	24,50	8,75	132,4	15,415
17,5	51,50	13,00	25,25	9,00	145,7	15,680
18	53,00	13,25	26,00	9,25	153,4	16,233
18,5	54,50	13,75	26,75	9,50	161,8	16,591
19	56,00	14,00	27,50	9,75	177,0	18,233
19,5	57,50	14,50	28,25	10,00	187,1	20,634
20	59,00	14,75	29,00	10,25	196,0	21,405
20,5	60,50	15,25	29,75	10,50	212,2	22,465
21	61,75	15,50	30,25	10,75	234,6	24,397

4:1 SLOPE

H	WL	hl	WS	hs	CONCRETE (C.Y.)	REINF. STEEL (LBS.)
4	12,25	3,25	6,50	2,25	6,9	806
4,5	13,75	3,50	7,25	2,75	8,3	887
5	15,50	4,00	8,00	3,00	10,7	1,023
5,5	17,00	4,25	9,00	3,25	12,5	1,225
6	18,75	4,75	9,75	3,50	14,7	1,360
6,5	20,25	5,25	10,50	3,75	17,4	1,474
7	21,75	5,50	11,50	4,00	20,6	1,885
7,5	23,50	6,00	12,25	4,50	23,5	2,209
8	25,00	6,25	13,00	4,75	26,2	2,183
8,5	26,50	6,75	14,00	5,00	29,7	2,451
9	28,25	7,25	14,75	5,25	35,0	3,819
9,5	29,75	7,50	15,50	5,50	38,3	3,973
10	31,25	8,00	16,50	6,00	42,4	4,366
10,5	33,00	8,25	17,25	6,25	46,3	4,694
11	34,50	8,75	18,00	6,50	52,0	5,108
11,5	36,00	9,00	18,00	6,75	59,3	6,335
12	37,75	9,50	19,75	7,00	64,8	6,794
12,5	39,25	10,00	20,50	7,25	70,0	6,997
13	40,75	10,25	21,25	7,75	79,3	8,246
13,5	42,50	10,75	22,25	8,00	85,6	8,858
14	44,00	11,00	23,00	8,25	94,5	9,374
14,5	45,75	11,50	23,75	8,50	101,2	9,976
15	47,25	12,00	24,75	8,75	113,9	10,756

6:1 SLOPE

H	WL	hl	WS	hs	CONCRETE (C.Y.)	REINF. STEEL (LBS.)
4	13,25	3,50	7,50	2,75	7,8	847
4,5	15,00	3,75	8,50	3,00	9,4	940
5	16,75	4,25	9,50	3,50	12,2	1,090
5,5	18,50	4,75	10,50	3,75	14,4	1,304
6	20,25	5,25	11,50	4,00	17,4	1,462
6,5	22,00	5,50	12,50	4,50	20,0	1,584
7	23,50	6,00	13,25	4,75	23,4	1,890

CONST. NO.		
PROJECT NO.	YEAR 2010	SHEET NO.
REVISIONS		
NO.	DATE	BY
		BRIEF DESCRIPTION

NOTE: QUANTITIES ON THIS SHEET ARE ESTIMATED TOTALS FOR ALL FOUR WINGWALLS.

NOTE: ADDITIONAL CONCRETE AND REINFORCEMENT QUANTITIES FOR BOX CULVERT CUT-OFF WALL SHALL BE ADJUSTED BASED ON AS-BUILT DIMENSIONS.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

WINGWALL DIMENSIONS AND QUANTITIES

STANDARD REINFORCED CONCRETE BRIDGE BOX AND SLAB TYPE

2010

CORRECT Edward P. Wasserman
DIRECTOR OF STRUCTURES

STD-17-14

DESIGNED BY: FINN / MAIN — DATE: 12-09
DRAWN BY: REAGAN BURNS — DATE: 04-10
SUPERVISED BY: FINN / MAIN / MAG — DATE: 10-09
CHECKED BY: — DATE:

DESIGNED BY: FINN / MAIN — DATE: 12-09
DRAWN BY: REAGAN BURNS — DATE: 04-10
SUPERVISED BY: FINN / MAIN / MAG — DATE: 10-09
CHECKED BY: — DATE:

COMMUNITY DEVELOPMENT ENTERPRISES

JACKSON SOLAR MICROGRID

ROOSEVELT PARKWAY

JACKSON, MADISON COUNTY, TENNESSEE

REVISIONS

THIS DRAWING SHALL BE CONSIDERED PRELIMINARY IN NATURE AND, IN NO WAY, FINAL OR COMPLETE, UNLESS THE SEAL OF THE ENGINEER OR SURVEYOR OF RECORD IS AFFIXED HEREON.

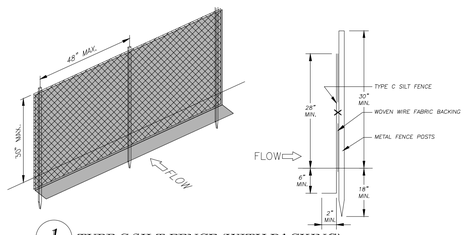
SHEET: SITE DETAILS

NUMBER: C-902

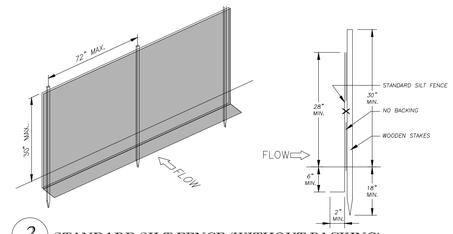
L.I. Smith and Associates, Inc.
LAND DEVELOPMENT | INFRASTRUCTURE DESIGN
SURVEYING SERVICES
302 North Caldwell Street, Paris, TN 38242 | 731-644-1014 | www.lismith.com
475 Metroplex Drive, Suite 212 Nashville, TN 37211 | 615-256-0290

DRAWN BY: NTG | CHECKED BY: WPS | SCALE:

PROJECT # 201044 | DATE: 01/15/2021



1 TYPE C SILT FENCE (WITH BACKING)
NO SCALE



2 STANDARD SILT FENCE (WITHOUT BACKING)
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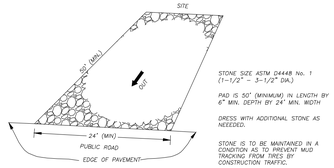
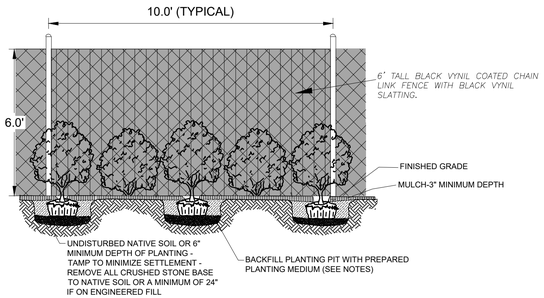


3 TEMPORARY CONSTRUCTION EXIT
NO SCALE

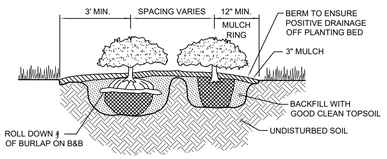
NOTES:

1. PLANT MATERIAL SHALL CONFORM TO "THE AMERICAN STANDARD FOR NURSERY STOCK" (ANSI Z60.1; LATEST EDITION) FOR SIZE FORM AND QUALITY
2. MYCORRHIZAL INOCULATES AND SUPER - ABSORBENT MATERIAL ADDED TO TOPSOIL BACKFILL AT THE MANUFACTURER'S RECOMMENDED RATE AS PER SPECIFICATIONS

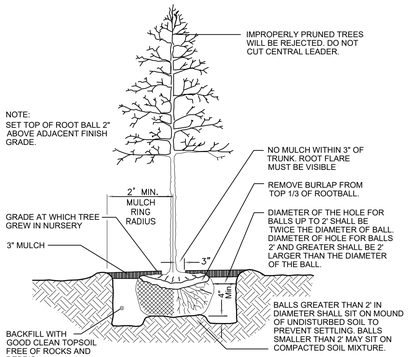


REMOVE ALL SYNTHETIC MATERIAL FROM AROUND ROOTBALL. REMOVE BURLAP AND ROPE FROM TOP ⅓ OF ROOTBALL

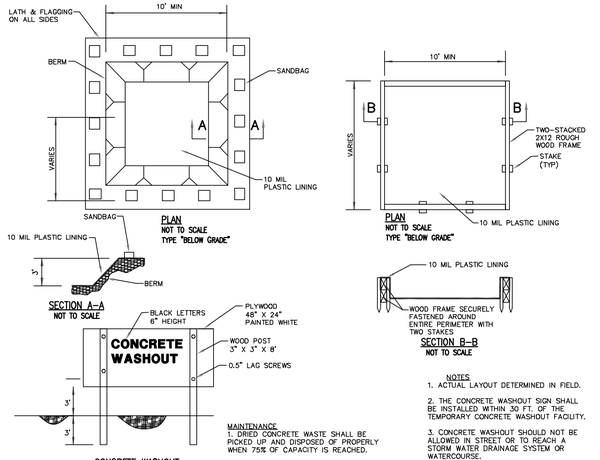
SCREENING ELEVATION VIEW
N.T.S.



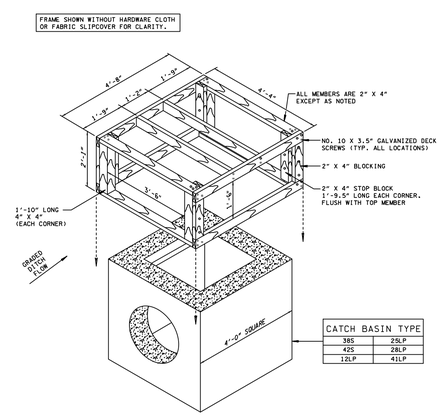
SHRUB / GROUND COVER PLANTING
NOT TO SCALE



TREE PLANTING
NOT TO SCALE



4.03 CONCRETE WASHOUT
NO SCALE



ISOMETRIC VIEW
CATCH BASIN FILTER ASSEMBLY
N.T.S.

EROSION CONTROL PLAN LEGEND: ① CATCH BASIN FILTER ASSEMBLY (TYPE 1)

CATCH BASIN FILTER ASSEMBLY GENERAL NOTES

(A) DRAWING TO BE USED WITH STANDARD TYPES 38S, 42S, AND D-CB-SERIES LP CATCH BASINS. SEE STANDARD DRAWINGS FOR CATCH BASIN DIMENSIONS AND DETAILS.

(B) THE CATCH BASIN FILTER ASSEMBLY IS TO BE USED WHERE INTERCEPTION OF CONCENTRATED FLOWS (e.g. DITCHES AND SWALES) IS REQUIRED AFTER STRUCTURES ARE CONSTRUCTED BUT PRIOR TO ESTABLISHING VEGETATION.

(C) 2 x 4 AND 4 x 4 PRESSURE TREATED MEMBERS SHOWN ARE NOMINAL DIMENSIONS. TYPICAL ACTUAL DIMENSIONS ARE 1.5 x 3.5 INCH AND 3.5 x 3.5 INCH RESPECTIVELY. ACTUAL DIMENSIONS OF WOOD MAY VARY EVEN GREATER DEPENDING ON MOISTURE CONTENT. ALL WOOD SHALL BE NO. 2 PRESSURE TREATED SOUTHERN YELLOW PINE.

(D) PERIODIC MAINTENANCE AND CLEANING OF THE STRUCTURE SHALL BE PERFORMED AS NECESSARY TO PREVENT CLOGGING OF THE FILTER FABRIC. FILTER ASSEMBLY MAY BE CLEANED AT AN ACCEPTABLE LOCATION WITH WATER OR BY BRUSHING AND BLOWING CLEAN WITH COMPRESSED AIR. MAINTENANCE AND CLEANING OF STRUCTURES WILL NOT BE MEASURED AND PAID FOR DIRECTLY BUT SHALL BE INCLUDED IN THE PRICE BID FOR THE STRUCTURE.

CATCH BASIN FILTER ASSEMBLY GENERAL NOTES (CONT.)

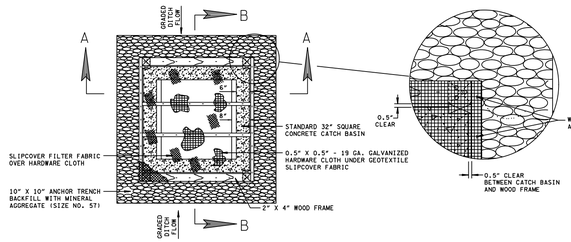
(E) DEFECTIVE WOOD, HARDWARE CLOTH OR FILTER FABRIC SHALL BE REPLACED AS NECESSARY TO INSURE PROPER FUNCTIONING OF FILTER ASSEMBLY. REUSE OF ASSEMBLIES IS ACCEPTABLE PROVIDED THE UNIT IS IN PROPER WORKING CONDITION. APPROVAL MUST BE GIVEN BY TDOT ENGINEER.

(F) ASSEMBLY AND STONE SHALL BE REMOVED AFTER UPSTREAM VEGETATION HAS BEEN ESTABLISHED OR OTHER SEDIMENT CONTROL STRUCTURES ARE IN PLACE. BACKFILL AND COMPACT ANCHOR TRENCH TO FINAL GRADE AS REQUIRED AFTER REMOVAL.

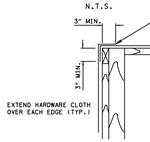
(G) IF NECESSARY, AT DIRECTION OF TDOT ENGINEER, SLIPCOVER MAY BE SECURED IN PLACE AT THE LOWEST PRACTICAL POINT WITH NYLON STRING, TWINE, WIRE OR OTHER SUITABLE MATERIAL.

(H) WHERE LARGE QUANTITIES OF SEDIMENT OR HIGH VELOCITIES OF APPROACHING WATER ARE ANTICIPATED DUE TO SPACING OF CATCH BASINS, DITCH GRADE, ETC...OTHER EROSION PREVENTION AND SEDIMENT CONTROL DEVICES MAY BE NECESSARY UPSTREAM OF FILTER ASSEMBLY.

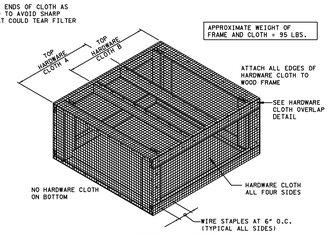
(I) ALL LABOR AND MATERIALS NECESSARY TO CONSTRUCT AND INSTALL TEMPORARY CATCH BASIN FILTER ASSEMBLY INCLUDING TRENCHING, BACKFILLING, STONE, AND SLIPCOVER SHALL BE PAID FOR UNDER ITEM NUMBER 209-40.41, CATCH BASIN FILTER ASSEMBLY (TYPE 1), PER EACH.



PLAN VIEW - CATCH BASIN FILTER ASSEMBLY



HARDWARE CLOTH OVERLAP DETAIL
N.T.S.



ISOMETRIC VIEW
FRAME WITH HARDWARE CLOTH
N.T.S.

INSTALLATION SEQUENCE FOR HARDWARE CLOTH

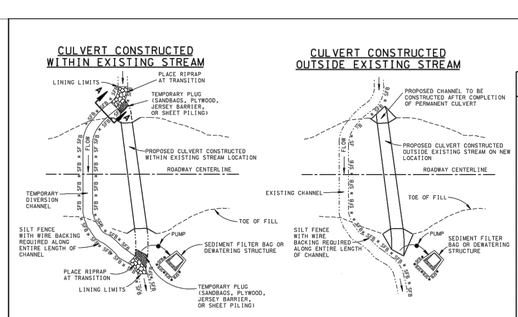
INSTALL TOP HARDWARE CLOTH A, PULL MATERIAL TIGHT, LAP AND STAPLE AS SHOWN. CUT TO LENGTH AND TRIM SHARP EDGES.

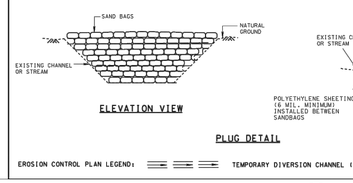
INSTALL TOP HARDWARE CLOTH B - OVERLAPPING CLOTH A. PULL CLOTH TIGHT, LAP, AND STAPLE AS SHOWN. CUT TO LENGTH AND TRIM ALL SHARP EDGES.

INSTALL HARDWARE CLOTH AROUND EXTERIOR OF WOOD FRAME USING ONE CONTINUOUS PIECE BEGINNING AT A CORNER, ENDING AT SAME CORNER, AND OVERLAPPING AS REQUIRED. PULL TIGHT AND STAPLE EACH SIDE BEFORE PROCEEDING WITH SUBSEQUENT SIDES.

TRIM EXCESS ALONG BOTTOM AS NECESSARY.

4.04 AREA INLET PROTECTION
NO SCALE





EROSION CONTROL PLAN LEGEND: TEMPORARY DIVERSION CHANNEL (DESCRIBE - SIZE AND TYPE OF LINING)

TEMPORARY DIVERSION CHANNELS GENERAL NOTES

(A) DIVERSION CHANNELS SHALL BE USED TO DIVERT NORMAL STREAM FLOW FROM AN ERODIBLE AREA IN ORDER TO PREVENT POLLUTION OF THE STREAM DUE TO EROSION.

(B) EXAMPLE SHOWN IS FOR NEW CULVERT CONSTRUCTION. OTHER PROJECTS WOULD BE CONSTRUCTED IN A SIMILAR MANNER.

(C) TEMPORARY DIVERSION CHANNELS SHALL BE DESIGNED USING A 2-YEAR, 24-HOUR STORM FREQUENCY FLOW RATE. STANDARD DRAWING EC-STR-31A, MAY BE USED AS A GUIDELINE FOR DETERMINING THE CHANNEL SIZE. FOR ANY SITE WHERE Q50 EXCEEDS 500 CFS, THE DESIGN OF THIS MEASURE SHOULD BE COMPLETED BY THE HYDRAULICS SECTION OF THE STRUCTURES DIVISION. AT SITES WHICH INVOLVE EXCEPTIONAL TENNESSEE WATERS OR SEDIMENT-IMPAIRED STREAMS, THE STABILITY OF THE RIPRAP CHANNEL LINING SHOULD BE DESIGNED FOR THE 5-YEAR, 24-HOUR PEAK FLOW.

(D) ALL TEMPORARY DIVERSION CHANNELS SHALL HAVE A TRAPEZOIDAL SHAPE AND THE BOTTOM WIDTH SHALL BE EQUAL TO OR GREATER THAN THE NATURAL CHANNEL BOTTOM WIDTH.

(E) TO DETERMINE RIPRAP CLASS AND DEPTH USE STANDARD DRAWING EC-STR-31A.

(F) ONLY GEOTEXTILE FABRIC (TYPE III) LISTED ON THE QUALIFIED PRODUCTS LIST SHALL BE USED.

(G) GEOTEXTILE (TYPE III) (EROSION CONTROL) SHALL BE USED EITHER WITH OR WITHOUT RIPRAP, AS RECOMMENDED IN NOTE B6 ON STANDARD DRAWING EC-STR-31A.

(H) GEOTEXTILE FABRIC (TYPE III) SHALL BE USED ALONE ONLY IN CHANNELS WITH INTERMITTENT FLOW. USE A RIPRAP LINED CHANNEL OR CULVERT WHERE THE STREAM FLOWS YEAR-ROUND.

(I) WHERE EXCAVATION FOR A DIVERSION CHANNEL EXPOSES BEDROCK, GEOTEXTILE FABRIC AND RIPRAP SHALL BE REQUIRED ONLY ON THE SIDES OF THE CHANNEL.

(J) RIPRAP TRANSITIONS AT THE ENTRANCE AND EXIT OF THE DIVERSION CHANNEL SHALL BE DESIGNED IN ACCORDANCE WITH APPROVED TDOT METHODS.

(K) DURING CONSTRUCTION OF THE DIVERSION CHANNEL, DAMAGE TO THE EXISTING STREAM AND DAMAGE TO THE CANOPY SHALL BE MINIMIZED. ALL EXISTING VEGETATION OUTSIDE THE CUT AND FILL LINES BUT INSIDE THE RIGHT-OF-WAY SHALL NOT BE DISTURBED UNLESS IT INTERFERES WITH SAFETY STANDARDS.

(L) THE PROJECT SHALL BE PLANNED IN ORDER TO MINIMIZE THE LENGTH OF TIME THE DIVERSION WILL BE REQUIRED.

(M) DIVERSION CHANNEL CONSTRUCTION SHALL BE COMPLETED IN THE DRY BEFORE DIVERTING WATER FROM THE EXISTING CHANNEL. WHERE THIS IS NOT FEASIBLE, TEMPORARY FLOW DIVERSION STRUCTURES CAN BE USED UNTIL WORK IS COMPLETE. THESE STRUCTURES CAN BE ANY NON-ERODIBLE MATERIAL.

(N) CONSTRUCTION SHALL PROCEED AS FOLLOWS:

1. CONSTRUCT A MEANDERING TEMPORARY CHANNEL ADJACENT TO THE PROPOSED PROJECT. ISOLATE THE TEMPORARY CHANNEL FROM THE EXISTING CHANNEL WITH TEMPORARY PLUGS. TEMPORARY EROSION CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 209 OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.
2. THE DIVERSION CHANNEL SHALL BE STABILIZED AND INSPECTED BY THE PROJECT ENGINEER BEFORE FLOW IS DIVERTED. DIVERT FLOW BY MOVING THE TEMPORARY PLUGS FROM THE TEMPORARY CHANNEL TO THE EXISTING CHANNEL. A COFFER DAM MAY BE USED UPSTREAM TO PREVENT STREAM FLOW DURING THIS OPERATION.
3. CONSTRUCT THE PROJECT IN THE EXISTING STREAM AND PLACE PERMANENT EROSION CONTROL ON THE EXISTING STREAM BANKS.
4. WHERE A TEMPORARY PLUG IS REQUIRED AT THE DOWNSTREAM END OF THE DIVERSION, IT SHOULD BE REMOVED FIRST. THEN REMOVE THE UPPER PLUG IN ORDER TO RELEASE FLOW INTO THE RECONSTRUCTED CHANNEL.
5. REMOVE LINING MATERIALS FROM THE DIVERSION CHANNEL. RESTORE THE AREA TO GRADE, AND STABILIZE EXPOSED SOILS.

(O) ALTERNATIVE DIVERSION METHOD MAY INCLUDE PARALLEL JERSEY BARRIERS LINED WITH POLYETHYLENE SHEETING (6 MIL MINIMUM).

(P) DIVERSION CHANNEL SHALL BE INSPECTED WEEKLY OR AFTER EVERY RAIN EVENT. ANY NEEDED REPAIRS SHALL BE DONE IMMEDIATELY.

(Q) FOR INSTALLATION DETAILS AND ITEM NUMBERS FOR DEWATERING STRUCTURES (EC-STR-1), SEDIMENT FILTER BAGS (EC-STR-2), AND SILT FENCE WITH WIRE BACKING (EC-STR-3C) SEE THEIR RESPECTIVE STANDARD DRAWINGS.

MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

NOT TO SCALE

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
TEMPORARY DIVERSION CHANNEL
10-26-92 EC-STR-31

4.05 TEMPORARY DIVERSION CHANNEL
NO SCALE

COMMUNITY DEVELOPMENT ENTERPRISES
JACKSON SOLAR MICROGRID
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

REVISIONS

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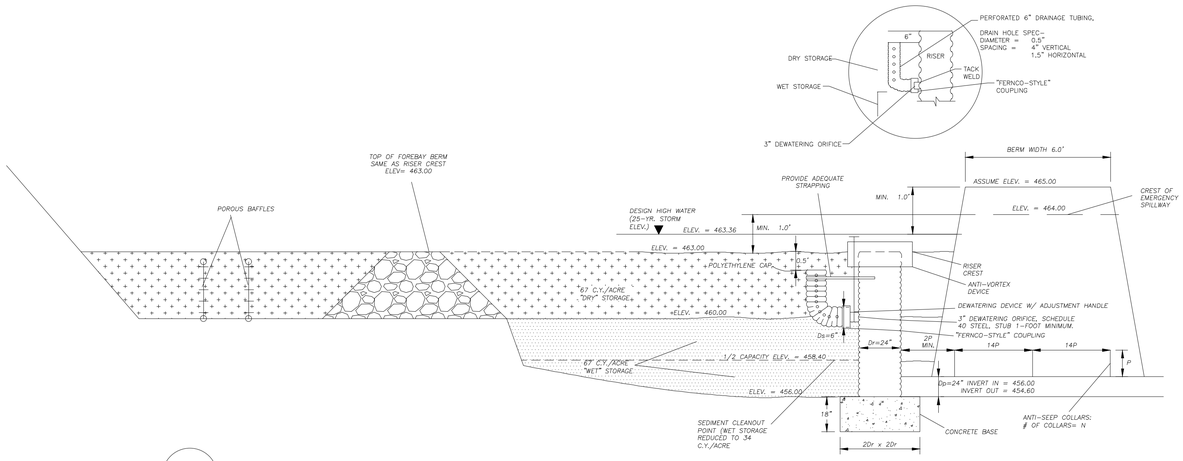
SHEET: SITE DETAILS
NUMBER: C-903

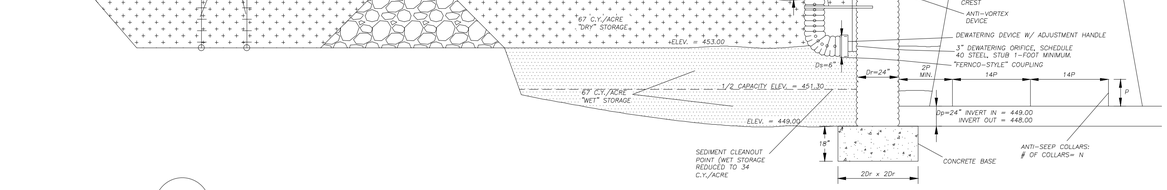
L.I. Smith and Associates, Inc.
LAND DEVELOPMENT | INFRASTRUCTURE DESIGN
SURVEYING SERVICES
302 North Caldwell Street, Paris, TN 38242 | 731-644-1014 | www.lismith.com
475 Metroplex Drive, Suite 212 Nashville, TN 37211 | 615-256-0290

DRAWN BY: NTG | CHECKED BY: WPS | SCALE:
PROJECT # 201044 | DATE: 01/15/2021

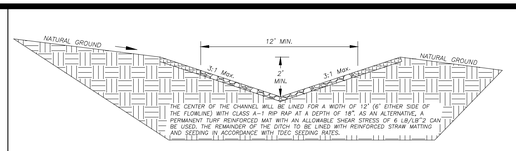
NRI000070



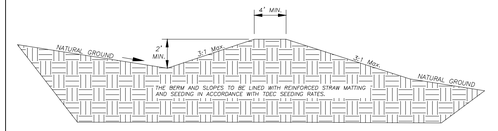
4.06 *SEDIMENT BASIN 1 (OUTFALL 8) CROSS SECTION & DEWATERING APPARATUS WITH DRAWDOWN DEVICE*
NOT TO SCALE



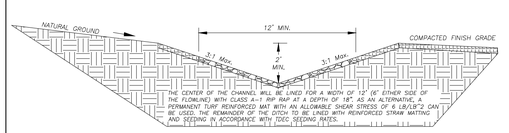
4.07 *SEDIMENT BASIN 2 (OUTFALL 10) CROSS SECTION & DEWATERING APPARATUS WITH DRAWDOWN DEVICE*
NOT TO SCALE



4.08 *TEMPORARY DIVERSION DITCH*
NO SCALE



4.10 *DIVERSION BERM*
NO SCALE



4.09 *PERMANENT DIVERSION DITCH*
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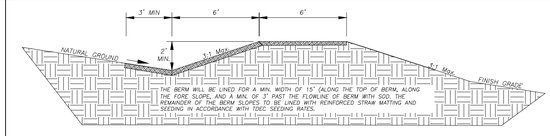
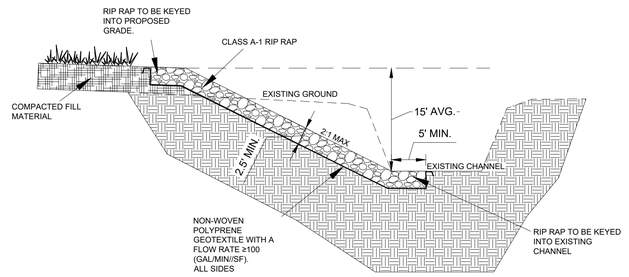


4.11 *CONTAINMENT BERM*
NO SCALE



4.12 *RIP RAP REVETMENT-BANK STABILZATION*

COMMUNITY DEVELOPMENT ENTERPRISES
JACKSON SOLAR MICROGRID
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

REVISIONS

THIS DRAWING SHALL BE CONSIDERED PRELIMINARY IN NATURE AND, IN NO WAY, FINAL OR COMPLETE, UNLESS THE SEAL OF THE ENGINEER OR SURVEYOR OF RECORD IS AFFIXED HEREON.

SHEET: SITE DETAILS
NUMBER: C-904

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DRAWN BY: NTG | CHECKED BY: WPS | SCALE:
PROJECT # 201044 | DATE: 01/15/2021

NRI000071

35Â°38'09.1"N 88Â°47'37.1"W
35.635857, -88.793644

L.I. Smith and Associates, Inc.
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SURVEYING SERVICES
302 North Caldwell Street, Paris, TN 38242 | 731-644-1014 | www.lismith.com

Jackson Solar Microgrid

January 26, 2021

Landscaping Requirements for

Hunt-Jackson Site

A. Existing Conditions of the 34-acre site:

1. Existing soils - This site had three major soils types, Collins silt, Feliciana silt, and Lexington silt loam.

a. Collins silt series consists of very deep, moderately well drained, moderately permeable soils. They formed in silty alluvium on flood plains of streams in the Southern Mississippi Valley Silty Uplands Major Land Resources Area. Slopes range from 0 – 2 percent.

b. Feliciana silt loam consists of very deep, well drained, moderately permeable soil in the Southern Mississippi Valley Loess Major Land Resources Area (MLRA 134). They formed in Peoria loess deposits more than 48 inches in thickness that overly terraces and uplands of the Southern Coastal Plain. Slopes range from 0 to 40 percent.

c. Lexington silt loam consists of very deep, well drained soils on level to moderately steep uplands. The soil formed in a mantle of loess about 2 to 3 feet thick and in the underlying loamy and sandy marine sediments. Slopes ranges from 0 to 30 percent.

2. Existing vegetation:

a. Existing trees are not ancient in nature. The existing vegetation is recent growth since the land has been cleared and farmed. A 1947 aerial photo shows the majority of the tract in cultivation. As recent as 1980, the heart of the property was still being cultivated. Within the last 10 years, a forest fire consumed the property from the middle over to the eastern boundary.

b. This Site does not show any evidence of past logging. New growth has been established through natural reseeding.

c. Ground cover that has taken over in the open area recently is the invasive weed, kudzu. The rest of the area is native ground cover of briars, ivy and other natural to the area.

3. Significant trees:

a. The accompanying map shows an estimate of the prevalent trees in each area.

b. Trees withing 50 feet of the property line that met the criteria of significant were located and shown on the map.

B. Site Utilization:

1. This Site will be used as a Solar Microgrid. The intended use for this site is to be full utilization of the entire property. The site will be graded to a gentle rolling grade with slopes that do not entice erosion.

2. The project Site will be covered with stone or rock over a membrane to allow for infiltration. No vegetative or tree planting will be undertaken on the site to establish new growth.

3. There is a proposed expansion of the facility to the tract to the north.

C. Vegetative Impact:

1. Solar Panels cannot be blocked by shadows caused by obstructions such as trees. Trees that are currently within 50 feet of the property line can reach heights of 70 to 100 feet. The most critical areas would be to the south and along the western and eastern boundaries. Due to the use and the fixtures on the site, vegetation and weedy plants would be a hindrance to the utilization.

a. All existing vegetation and tree will be removed from this site.

D. Proposed Replacement:

1. The proposed replacement would be evergreen shrubs or short evergreen trees placed in front of a chain link fence with mesh. This will provide an effective visual screen and secure the site. Some canopy trees will be placed along Roosevelt and near the battery storage buildings.

Respectfully,

Larry Smith, PE


CERTIFIED
HISTORIC
AERIALS
1947
NETRonline
NRI000075


CERTIFIED
HISTORIC
AERIALS
1980
NETRonline
NRI000076

TREE #	SPECIES	DIAM. (in)
330	BLACK CHERRY	12
331	ELM	10
332	BLACK CHERRY	14
333	OAK	12
334	BLACK CHERRY	8
335	ASH	15
336	OAK	40
341	ASH	10
342	MAPLE	15
343	ASH	16
344	BLACK CHERRY	8
345	BLACK CHERRY	8
346	BLACK CHERRY	15
347	BLACK CHERRY	10
348	BLACK CHERRY	15
350	CEDAR	6
351	HICKORY	12
352	ASH	12
354	BLACK CHERRY	10
356	BLACK CHERRY	10
358	ASH	10
359	ASH	14
360	BLACK CHERRY	14
361	ASH	26
362	BLACK CHERRY	18
364	OAK	9
365	ASH	10
366	ASH	10
367	BLACK CHERRY	8
368	ELM	10
369	ASH	10
371	CHERRY	15
372	HICK	10
373	OAK	24
374	OAK	10
375	OAK	32
376	BLACK CHERRY	10
377	ASH	18
379	POPLAR	26
380	CEDAR	8
381	ELM	8
382	BLACK CHERRY	12
383	ASH	12
384	ASH	12
387	BLACK CHERRY	24
388	ASH	20
389	ASH	8
390	ASH	12
391	BLACK CHERRY	12
392	OAK	24
395	BLACK CHERRY	14
396	CEDAR	14
397	HICKORY	16
398	CEDAR	8
399	ASH	18

V-2 REQUIRED TREE REMOVAL, TOTAL AREA: 4.08 AC, SAMPLE AREA: 0.23 AC

SPECIES	BDH 6"	12"	18"	24"	30"	>30"	BDH SAMPLE TOTAL (in)	MULTIPLIER (TOTAL AREA/SAMPLE AREA)	AREA TOTAL BDH REMOVAL
CHERRY	1						6	17.77	107
CEDAR		2					24	17.77	427
ELM		1	1				30	17.77	533
MAPLE		1	1				30	17.77	533
OAK							0	17.77	0
POPLAR		2	3				78	17.77	1386
SWEETGUM							0	17.77	0
PINE		4	2		4		204	17.77	3626

V-3 REQUIRED TREE REMOVAL, TOTAL AREA: 6.21 AC, SAMPLE AREA: 0.10 AC

SPECIES	BDH 6"	12"	18"	24"	30"	>30"	BDH SAMPLE TOTAL (in)	MULTIPLIER (TOTAL AREA/SAMPLE AREA)	BDH AREA TOTAL (in)
CHERRY							0	62.10	0
CEDAR							0	62.10	0
ELM							0	62.10	0
MAPLE							0	62.10	0
OAK							0	62.10	0
POPLAR							0	62.10	0
SWEETGUM							0	62.10	0
PINE		8	1	1			138	62.10	8570

V-4 REQUIRED TREE REMOVAL, TOTAL AREA: 3.99 AC, SAMPLE AREA: 0.10 AC

SPECIES	BDH 6"	12"	18"	24"	30"	>30"	BDH SAMPLE TOTAL (in)	MULTIPLIER (TOTAL AREA/SAMPLE AREA)	BDH AREA TOTAL (in)
CHERRY							0	39.90	0
CEDAR							0	39.90	0
ELM							0	39.90	0
MAPLE							0	39.90	0
OAK							0	39.90	0
POPLAR							0	39.90	0
SWEETGUM							0	39.90	0
PINE		8	1	1			138	39.90	5506

V-5 REQUIRED TREE REMOVAL, TOTAL AREA: 2.32 AC, SAMPLE AREA: 0.10 AC

SPECIES	BDH 6"	12"	18"	24"	30"	>30"	BDH SAMPLE TOTAL (in)	MULTIPLIER (TOTAL AREA/SAMPLE AREA)	BDH AREA TOTAL (in)
CHERRY							0	23.20	0
CEDAR							0	23.20	0
ELM		3					36	23.20	835
MAPLE		6					72	23.20	1670
OAK							0	23.20	0
POPLAR		6					72	23.20	1670
SWEETGUM							0	23.20	0
PINE							0	23.20	0

V-6 REQUIRED TREE REMOVAL, TOTAL AREA: 2.86 AC, SAMPLE AREA: 0.10 AC

SPECIES	BDH 6"	12"	18"	24"	30"	>30"	BDH SAMPLE TOTAL (in)	MULTIPLIER (TOTAL AREA/SAMPLE AREA)	BDH AREA TOTAL (in)
CHERRY							0	28.60	0
CEDAR							0	28.60	0
ELM							0	28.60	0
MAPLE							0	28.60	0
OAK		3					36	28.60	1030
POPLAR		5					60	28.60	1716
SWEETGUM							0	28.60	0
PINE		2	2				60	28.60	1716

V-7 REQUIRED TREE REMOVAL, TOTAL AREA: 2.60 AC, SAMPLE AREA: 0.10 AC

SPECIES	BDH 6"	12"	18"	24"	30"	>30"	BDH SAMPLE TOTAL (in)	MULTIPLIER (TOTAL AREA/SAMPLE AREA)	BDH AREA TOTAL (in)
CHERRY							0	26.00	0
CEDAR							0	26.00	0
ELM		4					48	26.00	1248
MAPLE		5					60	26.00	1560
OAK							0	26.00	0
POPLAR		6					72	26.00	1872
SWEETGUM							0	26.00	0
PINE							0	26.00	0

V-8 REQUIRED TREE REMOVAL, TOTAL AREA: 5.36 AC, SAMPLE AREA: 0.10 AC

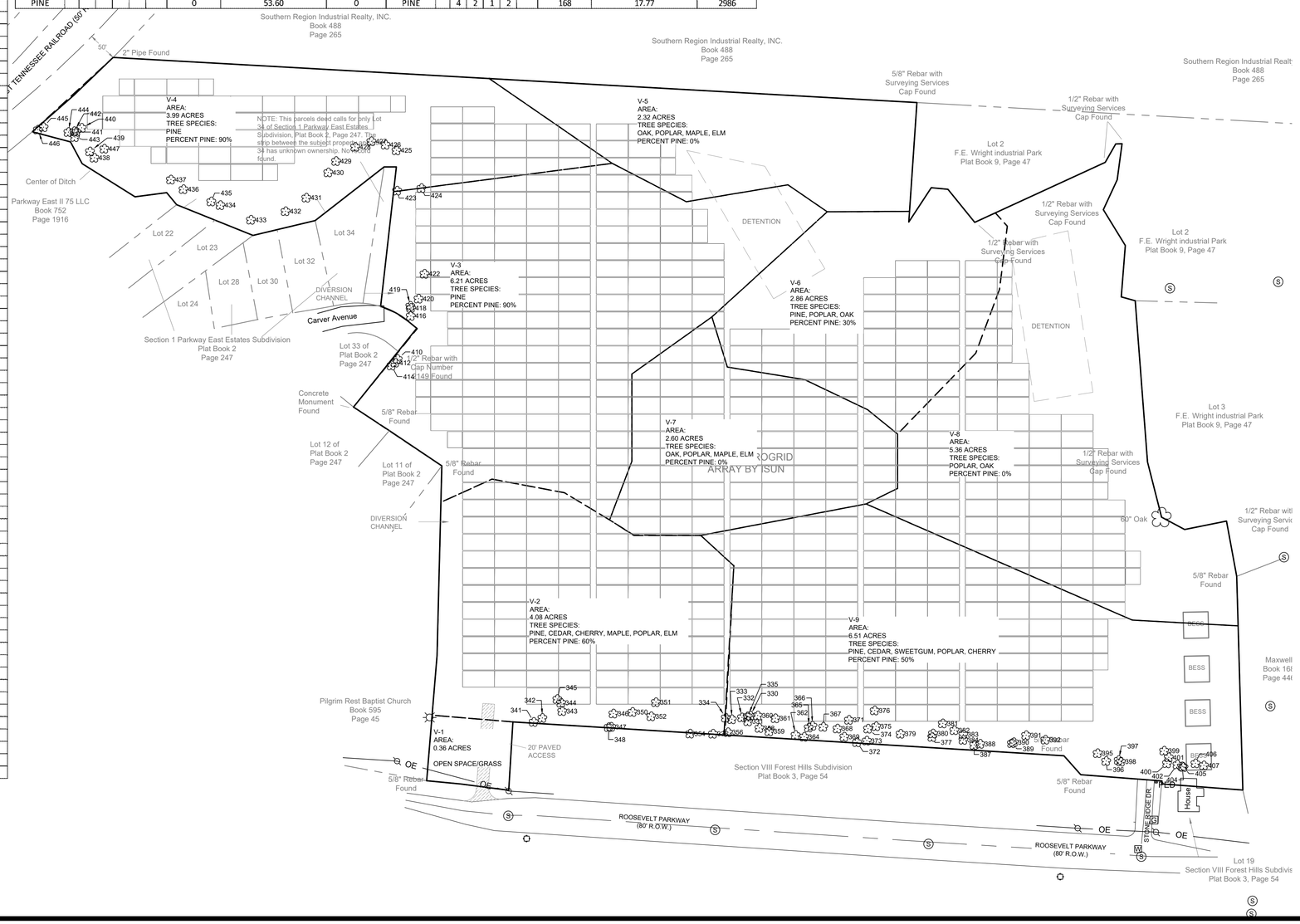
SPECIES	BDH 6"	12"	18"	24"	30"	>30"	BDH SAMPLE TOTAL (in)	MULTIPLIER (TOTAL AREA/SAMPLE AREA)	BDH AREA TOTAL (in)
CHERRY							0	53.60	0
CEDAR							0	53.60	0
ELM							0	53.60	0
MAPLE							0	53.60	0
OAK		4					48	53.60	2573
POPLAR		8					96	53.60	5146
SWEETGUM							0	53.60	0
PINE							0	53.60	0

V-9 REQUIRED TREE REMOVAL, TOTAL AREA: 4.08 AC, SAMPLE AREA: 0.23 AC

SPECIES	BDH 6"	12"	18"	24"	30"	>30"	BDH SAMPLE TOTAL (in)	MULTIPLIER (TOTAL AREA/SAMPLE AREA)	BDH AREA TOTAL (in)
CHERRY	1						6	17.77	107
CEDAR		2					24	17.77	427
ELM		1	1				30	17.77	533
MAPLE		1	1				30	17.77	533
OAK							0	17.77	0
POPLAR		5					60	17.77	1066
SWEETGUM		1					12	17.77	213
PINE		4	2	1	2		168	17.77	2986

VIE TOTAL TREE REMOVAL	
SPECIES	BDH REMOVAL (in)
CHERRY	213
CEDAR	853
ELM	3150
MAPLE	4297
OAK	3602
POPLAR	12857
SWEETGUM	213
PINE	22403
TOTAL	**47588**

AREA ID	AREA (AC)
V-1	0.36
V-2	4.08
V-3	6.21
V-4	3.99
V-5	2.32
V-6	2.86
V-7	2.60
V-8	5.36
V-9	6.51



SITE DATA

A. OWNERS OF RECORD: HUNT PROPERTIES, 1031 GREYSTONE SQUARE, JACKSON, TN 38305; MORRIS CROCKER, 15 SUTTON PLACE, JACKSON, TN 38305

DEVELOPER: COMMUNITY DEVELOPMENT ENTERPRISES, 1104 WHITEHALL STREET, JACKSON, TN 38301

B. SOURCE OF TITLE: BOOK 733, PAGE 731 AND BOOK 257, PAGE 455
TAX MAP 65, PARCEL 103.00 AND 104.00

CITY OF JACKSON, MADISON COUNTY, TENNESSEE

SITE AREA = +/- 32 ACRES
TOTAL AREA = +/- 34.27 ACRES

C. THE PROPERTY DESCRIBED HEREON IS LOCATED IN UNSHADED FLOOD ZONE "X", AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS DETERMINED BY THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP NO. 47113O168E, DATED AUGUST 03, 2009.

Landscaping Requirements for

Hunt-Jackson Site

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GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

COMMUNITY DEVELOPMENT ENTERPRISES
JACKSON SOLAR MICROGRID
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TENNESSEE

REVISIONS

THIS DRAWING SHALL BE CONSIDERED PRELIMINARY IN NATURE AND, IN NO WAY, FINAL OR COMPLETE, UNLESS THE SEAL OF THE ENGINEER OR SURVEYOR OF RECORD IS AFFIXED HERETO.

STATE OF TENNESSEE
LICENSED PROFESSIONAL ENGINEER
L. I. SMITH
No. 102901
AGRICULTURAL & STRUCTURAL
SURVEYOR
L. I. SMITH
No. 2044
01/15/2021

SHEET: VEGETATIVE IMPACT EVALUATION
NUMBER: C-101

L.I. Smith and Associates, Inc.
LAND DEVELOPMENT | INFRASTRUCTURE DESIGN
SURVEYING SERVICES
302 North Caldwell Street, Paris, TN 38242 | 731-644-1014 | www.lismith.com
475 Metroplex Drive, Suite 212 Nashville, TN 37211 | 615-256-0290

DRAWN BY:	NTG	CHECKED BY:	WPS	SCALE:	1"=100'
PROJECT #	201044			DATE:	01/15/2021

NRI000077

COMMUNITY DEV. ENT.
SOLAR MICROGRID
ROOSEVELT PARKWAY
JACKSON, MADISON COUNTY, TN

DETENTION

DETENTION

DIVERSION CHANNEL

DIVERSION CHANNEL

AREA: 28.52+/- ACRE
ZONE: RG-1 (RESIDENTIAL)

BESS

BESS

BESS

BESS

20.00'

20.00'

STONE RIDGE DR.

ROOSEVELT PARKWAY
(80' R.O.W.)

ROOSEVELT PARKWAY
(80' R.O.W.)

N

BEARING BASIS:
TENNESSEE STATE PLANE
COORDINATE SYSTEM -
NAD 1983
VERTICAL DATUM -
NAVD 1988

LEGEND

- PROPERTY LINE
- ADJOINER LINE
- CENTERLINE OF ROAD
- OE — OVERHEAD ELECTRIC
- G — NATURAL GAS
- SD — STORM DRAINAGE LINE
- SS — SEWER LINE
- FLOW LINE
- DRAINAGE AREA

PANEL COUNT: 39,500
PANEL SIZE: 40"x78.7"
PANEL ROW WIDTH: 91.24"

GRAPHIC SCALE
60 0 30 60 120 240
(IN FEET)
1 inch = 60 ft.

REVISIONS

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SHEET: PRELIM LAYOUT

NUMBER: C-200

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475 Metroplex Drive, Suite 212 Nashville, TN 37211 ↓ 615-256-0290

DRAWN BY: NTG | CHECKED BY: WPS | SCALE: 1"=60'
PROJECT # 201044 | DATE: 12/14/2020

NRI000078

State of Tennessee Comptroller of the Treasury

Real Estate Assessment Data

Home | About | New Search | Return to List

County Number: 057 **County Name:** MADISON **Tax Year:** 2020

Property Owner and Mailing Address

Jan 1 Owner:
HUNT DAVID B & MELISSA
D/B/A HUNT PROPERTIES
1031 GREYSTONE SQ
JACKSON, TN 38305

Property Location

Address: HWY 70 (N OF)

Map: 065 **Grp:** **Ctrl Map:** 065 **Parcel:** 104.00 **PI:** **S/I:** 000

Value Information

Reappraisal Year: 2018

Land Mkt Value:	$85,600	**Land Use Value:**	$35,600
Improvement Value:	$0	**Improvement Value:**	$0
Total Market Appraisal:	$85,600	**Total Use Appraisal:**	$35,600
		Assessment %:	25
		Assessment:	$8,900

General Information

Class:	11 - AGRICULTURAL		
City #:	359	**City:**	JACKSON
SSD1:	000	**SSD2:**	000
District:	05	**Mkt Area:**	K64
# Bldgs:	0	**# Mobile Homes:**	0
Utilities - Water / Sewer:	01 - PUBLIC / PUBLIC	**Utilities - Electricity:**	01 - PUBLIC
Utilities - Gas / Gas Type:	01 - PUBLIC - NATURAL GAS	**Zoning:**	

Subdivision Data

Subdivision:

Plat Bk:	**Plat Pg:**	**Block:**	**Lot:**

Additional Description

Building Information

Extra Features

Sale Information

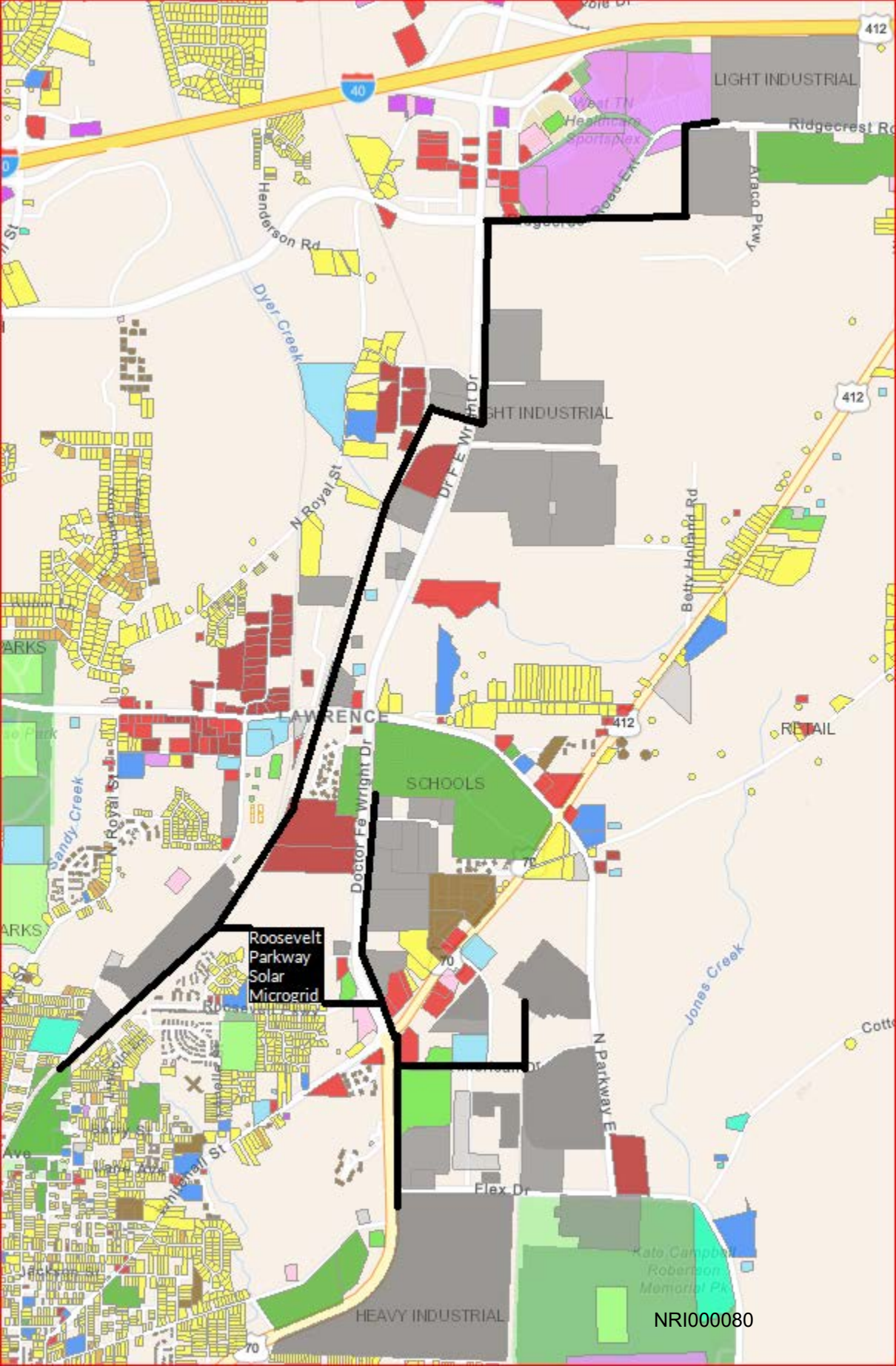
Sale Date	Price	Book	Page	Vac/Imp	Type Instrument	Qualification
03/21/2016	$14,270	733	731	VACANT	WD	A
12/30/2013		722	560	VACANT	QC	
02/29/2000	$0	603	553			
03/29/1998	$131,000	583	418	VACANT	WD	H
04/30/1971	$0	270	379			

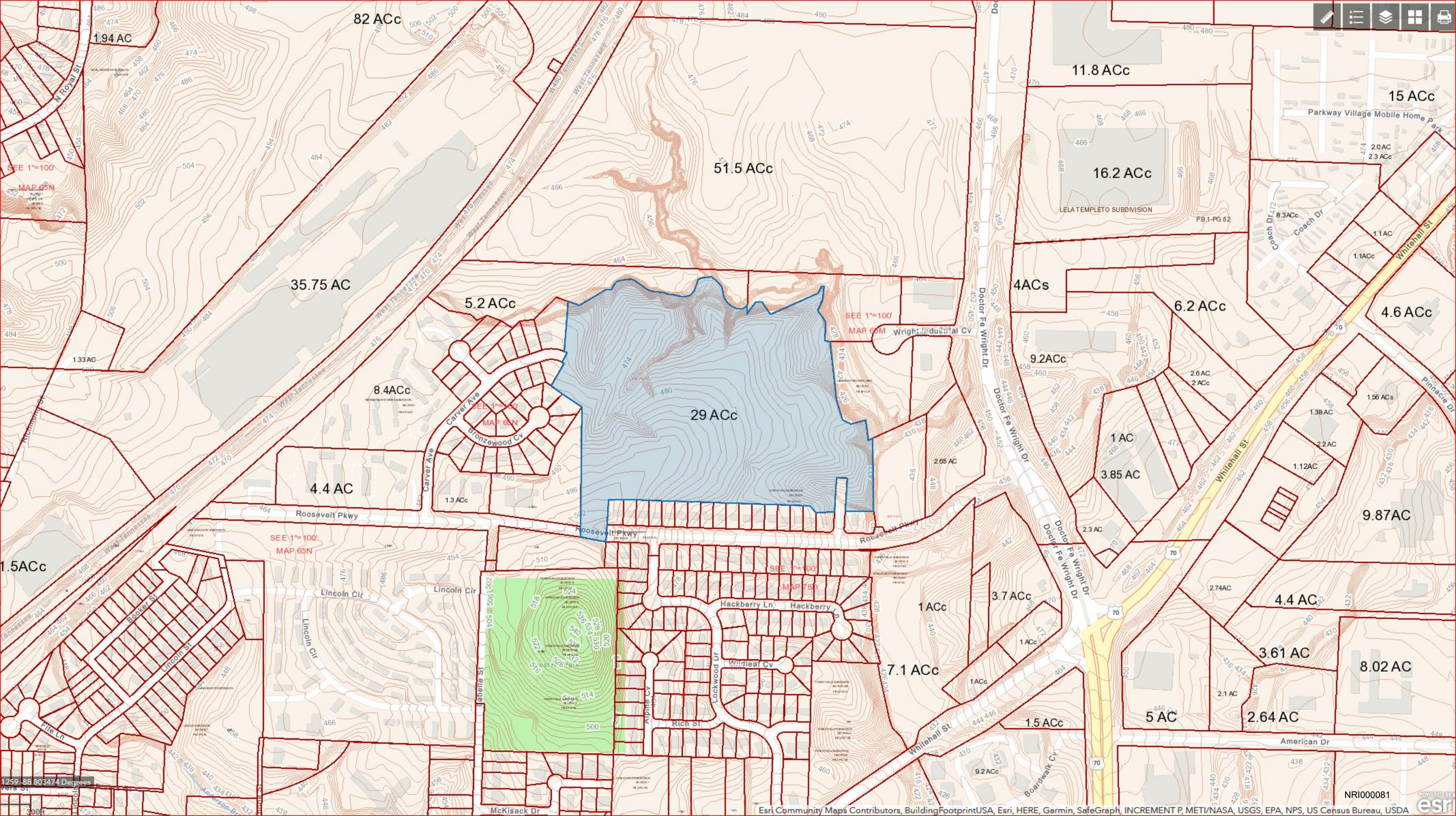
Land Information

Deed Acres: 28.54 **Calc Acres:** 0.00 **Total Land Units:** 28.54

Land Type: 20 - ACREAGE **Soil Class:** **Units:** 28.54

NRI000079


Roosevelt Parkway Solar Microgrid
LIGHT INDUSTRIAL
HEAVY INDUSTRIAL
SCHOOLS
RETAIL
LAWRENCE
Henderson Rd
Dyer Creek
N Royal St
Doctor Fe Wright Dr
Betty Holland Rd
Araco Pkwy
Ridgecrest Rd
Flex Dr
N Parkway E
Jones Creek
Sandy Creek
412
40
70
NRI000080


82 ACc
1.94 AC
51.5 ACc
11.8 ACc
15 ACc
Parkway Village Mobile Home Park
16.2 ACc
LELA TEMPLETO SUBDIVISION
P.B.1-PG 62
35.75 AC
5.2 ACc
29 ACc
4ACs
6.2 ACc
4.6 ACc
9.2ACc
8.4ACc
4.4 AC
1.3 ACc
2.65 AC
3.85 AC
1 AC
9.87AC
1.5ACc
1 ACc
3.7 ACc
7.1 ACc
1.5 ACc
5 AC
2.64 AC
3.61 AC
8.02 AC
4.4 AC
2.74AC
9.2 ACc
SEE 1"=100'
MAP 65N
MAP 65M
MAP 78D
Doctor Fe Wright Dr
Wright Industrial Cv
Roosevelt Pkwy
Carver Ave
Bronzewood Cv
Lincoln Cir
Lincoln St
Brooker St
Hackberry Ln
Wildleaf Cv
Lockwood Dr
Alpine Cv
Rich St
Isabelle St
Whitehall St
Coach Dr
American Dr
Boardwalk Cv
Hite Ln
McKisack Dr
Richmond Dr
N Royal St
West Tennessee
Pinnacle Dr
1.56 ACs
1.38 AC
2.2 AC
1.12AC
2.3 AC
2.6 AC
2 ACc
2.0 AC
2.3 ACc
8.3ACc
1.1 AC
1.1ACc
2.1 AC
1.33 AC
NRI000081
Esri Community Maps Contributors, BuildingFootprintUSA, Esri, HERE, Garmin, SafeGraph, INCREMENT P, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA

Soil Map—Madison County, Tennessee
(Roosevelt Pkwy Site)

Map Scale: 1:2,500 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Madison County, Tennessee
Survey Area Data: Version 14, Sep 16, 2019

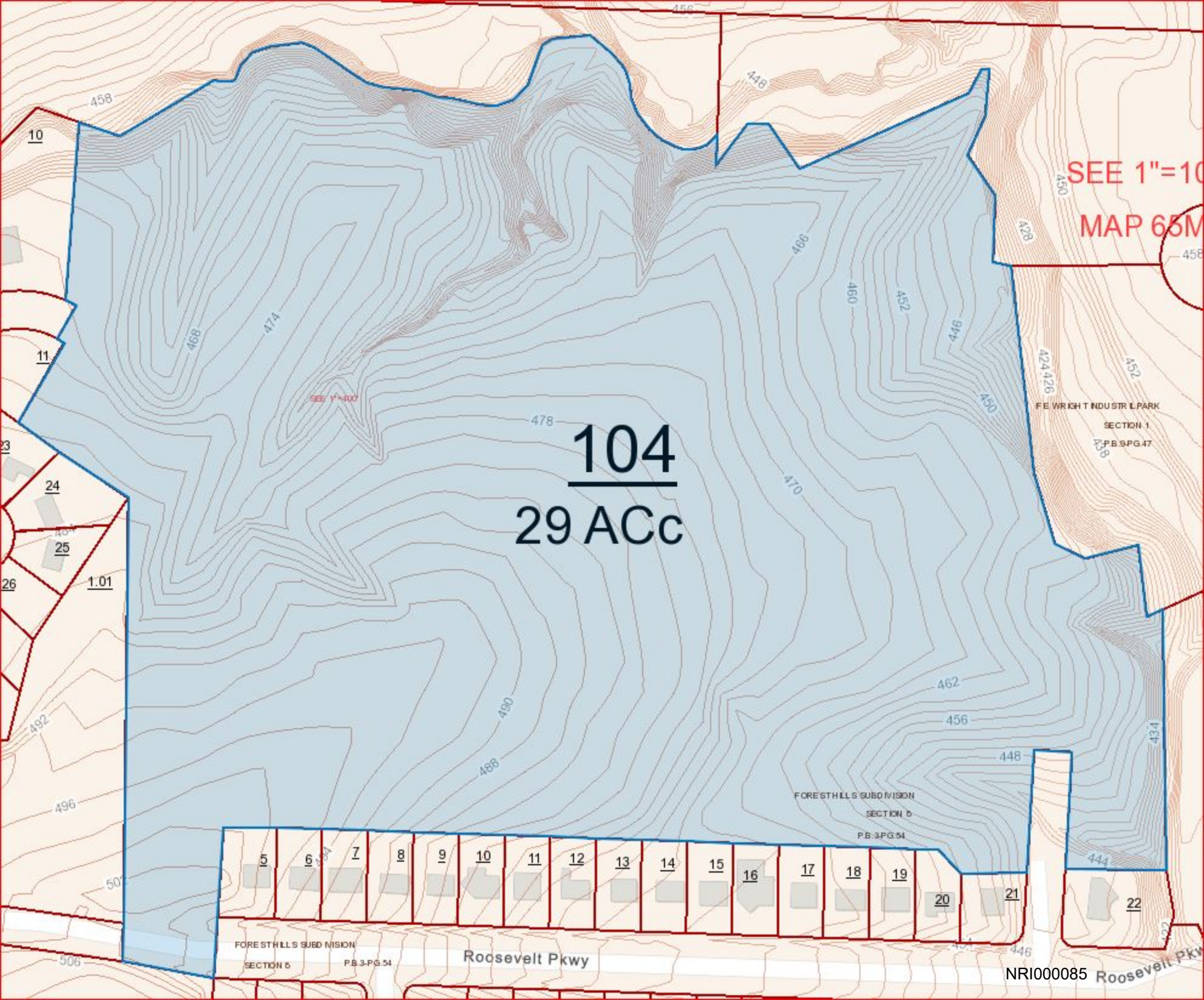
Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Feb 10, 2016—Oct 17, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Cs	Collins silt loam, 0 to 2 percent slopes, frequently flooded, brief duration	2.3	7.8%
FcB	Feliciana silt loam, 2 to 5 percent slopes, northern phase	10.0	34.0%
LeD3	Lexington silt loam, 8 to 12 percent slopes, severely eroded	0.2	0.8%
LeE	Lexington silt loam, 12 to 20 percent slopes	16.9	57.4%
Totals for Area of Interest		**29.4**	**100.0%**


104
29 ACc
SEE 1"=400'
SEE 1"=10
MAP 65M
F.E. WRIGHT INDUSTRIAL PARK
SECTION 1
P.B. 3-PG. 47
FOREST HILLS SUBDIVISION
SECTION 5
P.B. 3-PG. 54
FOREST HILLS SUBDIVISION
SECTION 5
P.B. 3-PG. 54
Roosevelt Pkwy
Roosevelt Pkwy
NRI000085

The Civil Engineer's name is

Nathan Grasfeder | Engineer

Office: 731-644-1014

www.lismith.com | ngrasfeder@lismith.com

302N Caldwell St, Paris, TN 38242

BYLAWS OF
COMMUNITY SERVICES COOPERATIVE OF JACKSON I

This version adopted February 1, 2021

ARTICLE I
GENERAL PROVISIONS

Section 1.1. Defined Terms. These Bylaws define certain words, phrases, and terms ("Defined Terms"). In general, Defined Terms are: (1) defined in a full sentence or part of a sentence; (2) capitalized, underlined, and enclosed within quotation marks when defined; (3) enclosed within parenthesis when defined in part of a sentence; and (4) capitalized when otherwise used in these Bylaws. Except as otherwise provided in these Bylaws and subject to the context requiring otherwise, Defined Terms have the meaning specified in the appropriate Bylaw.

Section 1.2 Law and Charter. These Bylaws are subject to Law and the Charter filed with the Tennessee Secretary of State ("Charter"). If, and to the extent that, a Bylaw conflicts with Law or the Charter, then the Law or Charter control. "Law" includes applicable (1) local, state, and federal statutes and regulations, and (2) legally binding contracts enforceable by or against the Cooperative, including the Member Agreement.

Section 1.4. Validity of Electronic Signatures. To the extent that Member Agreement or any other document between the Cooperative and the Members or Directors, is completed or transmitted by electronic means, the Member or Director agrees to be bound by federal and state laws and regulations governing the validity of such electronic signatures, and agrees that any such electronic transmission to or from the Member or Director satisfies any requirements imposed by the law that a document, notice, minutes or other communication be in writing. The Member or Director agrees that any document sent electronically to the Member or Director or former Member at the Member's last known electronic address is considered received on the date sent by the Cooperative.

ARTICLE II
MEMBERSHIP

Section 2.1. Eligibility Requirements. An Entity may become a member of the Cooperative if: (1) it signs a Member Agreement, and consumes supplemental electric energy furnished by the Cooperative (such person being a "Member" and the Member being in a "Membership"). A "Cooperative Service" is supplemental electric energy provided by the Cooperative. An "Entity" includes a domestic or foreign business or nonprofit corporation, limited liability company, or any agency or division of government. An applicant is eligible if the location it occupies

1. annually requires or is expected to annually require at least 1,000,000 kilowatt-hours (kWh) of electric energy; and

2. uses electric energy on a demand curve consistent with the Cooperative's requirements.

Section 2.2. Cooperative Membership. A Member shall: (1) comply with these Bylaws; (2) comply with any rules or regulations of the Cooperative; (3) provide and maintain a current mailing address and telephone number with the Cooperative; and (4) pay the Cooperative for the Cooperative Service. These Bylaws are a contract between the Cooperative and a Member. If a

Member fails to comply with the Bylaws or the Member Agreement, the Cooperative may suspend or terminate the Member or the Cooperative Service provided to the Member.

1. Each Member agrees to:
   a. Comply with the Bylaws;
   b. Comply with the Member Agreement and any rules established and approved in the Member Agreement;
   c. Pay dues of $10.00 per year.
   d. Pay for the Cooperative Services used at prices, rates, or amounts established in the Member Agreement.

2. The Member Agreement will be on a form provided by the Cooperative. The Member Agreement will require a review of the applicant's electric energy demand curve. There is no connection fee or deposit.

3. Unless the Member Agreement provides otherwise, if the Cooperative Service is not paid for within 30 days, the outstanding amount owed to the Cooperative bears a late fee at the monthly periodic rate of 1.5% (18% per annum) until paid in full.

4. In no event shall the responsibility of the Cooperative extend beyond the point of delivery. The Cooperative shall repair malfunctioning of Cooperative Equipment or any error occurring in the Cooperative's billing procedures.

Section 2.3. Acceptance into Membership. Upon complying with the requirements set forth in Section 2.2, an applicant shall be accepted into Membership in, and become eligible to receive supplemental electric energy provided by the Cooperative. If the Member is unable to abide by the Member Agreement and these Bylaws, then the person's Membership may be suspended or terminated by the Cooperative.

Section 2.4 Provision of Cooperative Services. The Cooperative shall use reasonable diligence to furnish its Members with adequate and dependable supplemental electric service. However, the Cooperative does not exist to replace the existing municipal electric service, unless the municipal electric service is not dependable. In case of emergency, or as requested by government or emergency officials or representatives, the Cooperative may interrupt the provision of Cooperative Services to Members.

Each Member shall pay for such purchases when they become due and payable in accordance with the Member Agreement and published rate classifications and rate schedules established by the Cooperative. A Member may have more than one service connection from the Cooperative. The Cooperative's accounting procedures will reflect both connections.

Section 2.5. Wiring of Premises; Responsibility for Wiring, Meter Tampering or Bypassing and for Damage to Cooperative Properties. Each Member shall cause all premises receiving electric service pursuant to its Membership to become and to remain wired in accordance with the specifications of the Tennessee Fire Insurance Underwriters Association, the National Electrical Code, any applicable state code or local government ordinances, and requirements of the

Cooperative. The Cooperative will provide the Cooperative Service at a location agreed to with the Member using Cooperative Equipment. A Member shall: (1) protect Cooperative Equipment; and (2) maintain any protective device or procedure to protect the connection. A Member shall not tamper with, alter, interfere with, damage, or impair Cooperative Equipment.

Section 2.6. Member Arbitration, Indemnification, and Liability. Whenever requested by the Cooperative, a Member shall:

(1) Submit a claim or dispute between the Member and the Cooperative regarding the Member Agreement or the Cooperative's provision of a Cooperative Service, or the Member's use of a Cooperative Service to mediation and arbitration and shall comply with an arbitration award according to the rules and procedures prescribed by the operative _____UNDER CONSIDERATION _____. A demand for arbitration shall be made within a reasonable time after the claim, dispute or other matter in question has arisen.

(2) Indemnify the Cooperative for, and hold the Cooperative harmless from, liabilities, damages, costs, or expenses, including reasonable attorney fees and legal expenses, incurred by the Cooperative, or by a Cooperative Director, Officer, employee, agent, or representative (collectively, "Cooperative Official"), and caused by the Member's negligence, gross negligence, or willful misconduct, or by the unsafe or defective condition of a location occupied by the Member that is not the fault of the Cooperative.

In general, a Member is not liable to third parties for the Cooperative's acts, debts, liabilities, or obligations solely because of Membership in the Cooperative. A Member may become liable to the Cooperative as provided in the Member Agreement or Bylaws or as otherwise agreed to by the Cooperative and the Member.

Section 2.7. Access. Each Member shall make available to the Cooperative a suitable site, as determined by the Cooperative, whereon to place the Cooperative's physical facilities for the furnishing and metering of electric service and shall permit the Cooperative's authorized employees, agents and independent contractors to have access thereto safely and without interference from any hostile source for inspection, maintenance, replacement, relocation, repair or disconnection of such facilities at all reasonable times. As part of the consideration for such service, each Member shall be the Cooperative's bailee of such facilities and shall accordingly desist from interfering with, impairing the operation of or causing damage to such facilities, and shall use its best efforts to prevent others from so doing.

Section 2.8. Member to Grant Property Rights to Cooperative. The Member Agreement shall grant the Cooperative a right-of-way, license or other grant or interest in Member property, under such lands owned, leased, mortgaged, by the Member to connect the Cooperative Service or for a Cooperative Purpose. In the event Member has a mortgage or lien on a property, the Member shall not use the mortgage or lien as a reason to object to the grant of property rights pursuant to this section. A "Cooperative Purpose" is: (1) installing, constructing, inspecting, monitoring, operating, repairing, maintaining, removing, relocating, upgrading, or replacing Cooperative

Equipment; (2) clearing, trimming, removing, or managing any trees, bushes, brush, or other vegetation to run wire underground to the Member facility; (3) providing a Cooperative Service to a Member; (4) monitoring, measuring, or maintaining a Cooperative Service provided to a Member; (5) authorizing, permitting, satisfying, or facilitating an obligation incurred, or right granted, by the Cooperative regarding use of Cooperative Equipment; or (6) safely, reliably, and efficiently providing a Cooperative Service to the Member.

Section 2.9. Energy Conservation. Member and Cooperative shall work together to enhance energy management, to more efficiently utilize electric energy, or to conduct energy usage research.

Section 2.10 Statement of Nondiscrimination. The Cooperative does not discriminate on the basis of race, color, national origin, sex, religion, age, or disability. The Cooperative encourages persons who believe they have been improperly discriminated against to contact the General Manager. Written discrimination complaints must be filed not later than 180 days from the date of the alleged discrimination.

ARTICLE III
MEMBERSHIP SUSPENSION AND TERMINATION

Section 3.1. Suspension.

1. Suspension Reasons. The Cooperative may suspend a Member for the following reasons ("Suspension Reasons"):
   a. Failing to comply with the Member Agreement of these Bylaws;
   b. For good cause if the Member legally dissolves, or legally ceases to exist; tampers with, alters, interferes with, damages, or impairs any Cooperative Equipment; or voluntarily requests suspension.

2. Notice and Comment. Unless otherwise provided in these Bylaws, and following the occurrence of a suspension reason other than a Member's voluntary request for suspension, the Cooperative:
   a. Provides the Member at least fifteen (15) days prior written notice of the Member's possible suspension and the underlying suspension reason; and
   b. Notifies the Member that the Member has, and allows the Member, at least five (5) days after the effective date of the notice to comment upon the suspension reason, either orally or in writing.

Any written suspension notice provided by mail must be mailed to the Member's most current address shown on the membership list.

3. Effect of Member suspension upon Cooperative. Upon a Member's suspension, then:
   a. The Cooperative's duties, obligations, and liabilities imposed by these Bylaws for the Member cease; and
   b. The Cooperative may cease providing any Cooperative services to the Member.

4. Effect of Member suspension upon Member. A suspended Member forfeits and relinquishes all rights provided in the Member Agreement and these Bylaws. In particular, a suspended Member forfeits and relinquishes any voting rights provided by these Bylaws. A suspended Member, however, remains subject to all obligations imposed by the Member Agreement and these Bylaws.

5. Lifting of Suspension. A Member's suspension is automatically lifted upon the Member rectifying, to the Cooperative's reasonable satisfaction, the underlying suspension reason within ten (10) days of the suspension. The Manger may lift any Member suspension for good cause as determined by the Board.

Section 3.2. Termination. The membership of the Member shall be terminated without further action by the Cooperative unless the Member shall request in writing within thirty (30) days of the effective date of the suspension a hearing before the Board. The termination, but not the suspension, shall be held in abeyance until the Board votes on the termination. Termination of a Member does not release the Member from any debts, liabilities, or obligations owed the Cooperative. Upon a Member's termination from the Cooperative, and after deducting any amounts owed the Cooperative, the Cooperative shall return to the Member any amounts due to the terminated Members, if any, unless deemed otherwise for good cause by the Board.

Section 3.3. Termination by Withdrawal or Resignation. A Member shall withdraw from membership upon such generally applicable conditions as the Manager shall prescribe upon becoming ineligible under the provisions of Section 2.1 for membership in the Cooperative.

Section 3.4. Effect of Termination. Upon the termination in any manner of a Membership, the former Member shall be entitled to a refund of any over payment, less any amounts due the Cooperative. Should an action be commenced or an attorney employed to enforce payments of any amount owing on an account, the Member agrees, jointly and severally, to pay all costs of enforcement, including reasonable attorneys' fees and a late fee at the monthly periodic rate of 1.5% per month (18% per annum) until paid in full.

ARTICLE IV
MEETINGS OF MEMBERS

Section 4.1. Annual Meeting. For the purposes of electing Directors, hearing and passing upon reports covering the previous fiscal year, and transacting such other business as may properly come before the meeting, the annual meeting of the Members shall be held on such date and beginning at such time as the Board from year to year shall provide. It shall be the responsibility of the Board to make adequate plans and preparations for and to encourage Member attendance at the annual meeting. Failure to hold the annual meeting at the designated time shall not constitute a forfeiture or dissolution of the Cooperative. These meetings may be conducted over zoom or any other electronic media.

Section 4.2. Special Member Meetings. A special meeting of the Members may be called by resolution of the Board or upon written request of at least the greater of three Members or twenty-five percent (25%) of all the Members, signed and dated within thirty (30) days following the first

signature. The Cooperative will give notice of the special meeting to all Members. The special meeting shall be held in Madison County, Tennessee on such date, and beginning at such hour as designated by the Members calling the special meeting.

Section 4.3. Notice of Member Meetings. Written notice of the place, date and hour of the meeting, and, in the case of a special meeting or of an annual meeting at which business requiring special notice is to be transacted, the purpose or purposes of the meeting, shall be delivered to each Member not less than fourteen (14) nor more than forty-five (45) days before the date of the meeting. Such notice may be made personally; by United States Postal Service either with or without other documents, or electronically at a verified Member e-mail address. No matter that requires the affirmative votes of a clear majority of the Cooperative's Members attending a Member meeting shall be acted upon unless notice of such matter shall have been contained in the notice of the meeting. If mailed, such notice shall be deemed to be delivered when deposited in the United States mail, addressed to the Member at his address as it appears on the Cooperative's records, with postage thereon prepaid and postmarked at least fourteen (14) days before the meeting date. If transmitted via e-mail, such notice shall be deemed delivered when transmitted to a previously verified e-mail address for Member. The inadvertent failure of any Member to receive such notice shall not invalidate any action which may be taken by the Members at any such meeting. In making time calculations required by this section, the day of the meeting shall not be counted.

Section 4.4. Quorum for Member Meetings. Whenever ballots are cast by Members for the election of a director, attendance in person, by proxy, or by the submission of mailed ballots of at least twenty-five percent (25%) of the total Members of the Cooperative at any meeting of the Members shall constitute a quorum for the purpose of electing Directors and conducting other Cooperative business. Once a quorum is established for election of Directors, the results of the vote for Directors may be announced. Once a quorum is established for conducting Cooperative business, all business may be transacted despite the loss of a quorum. If a quorum is not established, the chair may recess the meeting to another time and date to any place within Madison County. The Secretary of the Cooperative, or his designee, shall notify all Members of the time, place and date of the recessed meeting by delivering notice thereof as provided in Section 4.3 of these Bylaws. At all meetings of the Members, the Secretary shall annex to the meeting minutes or incorporate therein by reference, a list of those who were present in person, by mailed-in ballot and by proxy.

Section 4.5. Credentials and Elections Committee. The Board appoints a Credentials and Elections Committee consisting of an uneven number of person, not less than three (3) nor more than seven (7). Members of the Credentials and Elections Committee may not be close relatives or members of the same household of existing Directors or known candidates for Directors to be elected at such meeting. The Credentials and Elections Committee decides Member meeting issues. A Credentials and Elections Committee decision or action requires a vote of at least a majority of the Credentials and Elections Committee members present. Except as otherwise provided in these Bylaws, Credentials and Elections Committee decisions or actions during, or within a reasonable time before or after, a Member meeting are final. In the event a member of the Credentials and Elections Committee resigns or becomes unable to participate due to illness or death, the Board may appoint, in its sole discretion an alternate member. The Committee may elect

its own chairperson. In the exercise of its responsibility, the Credentials and Elections Committee shall have available to it the advice of counsel provided by the Cooperative. The Credentials and Elections Committee shall certify the results of all elections and other balloting. It shall be the responsibility of the Credentials and Elections Committee to establish or approve the manner of conducting Member registration at a Member meeting, to pass upon all questions that may arise with respect to the registration of Members in person and the authenticity and validity of mailed-in ballots and proxies, to oversee the counting of all ballots cast in any election, to rule upon all other questions that may arise relating to Member voting and the election of candidates for Director. The Credentials and Elections Committee's responsibilities include, but are not limited to, reviewing the process for the nomination and election of Directors and ruling on the validity of qualifications of candidates and nominees.

Section 4.6. Voting. Each Member who is not in a status of suspension as provided for in Section 3.1 shall be entitled to one vote and no more upon each matter submitted to a vote at a meeting of the Members. An Entity may vote through a duly designated representative, qualified as such upon registering for the meeting. Voting by Members shall be allowed upon the presentation to the Cooperative prior to, or upon registration at, each Member meeting of satisfactory evidence entitling the person to vote on behalf of the Entity. Such evidence shall not be required in any voting by mailed ballots for election of Directors. No one may vote on behalf of more than one Member. At all meetings of the Members at which a quorum is present all questions shall be decided by a majority of the Members voting thereon, except as otherwise provided by law or by the Cooperative's Charter or these Bylaws. Members may not accumulate their votes.

Members shall vote for the election of Directors by ballots mailed in or delivered to the address indicated in the notice of meeting on or before the date and hour indicated in such notice. Members shall not be permitted to vote in person for the election of Directors, but may attend and register and participate in all other proceedings of the meeting of Members to the fullest extent, and including the voting in person on all other questions that come before the meeting of Members. All elections of Directors shall be conducted so that the ballots will be return-mailed or delivered so as to assure that the way the vote is cast may not be determined and to assure that Members vote only once. The counting of mail ballots shall be conducted by or under the direction of the Credentials and Elections Committee prior to the meeting of the Members. The results will not be made official until certified by the Credentials and Elections Committee and announced by the chair of the Committee during the meeting. The provisions of the Section shall not apply to the election of a Director to fill a vacancy caused by the removal of a Director by the Members, in which case the provisions of Section 5.12 (Removal of Directors by Members) shall be followed.

The Board may authorize balloting by electronic means as an alternative to mail ballots or as replacement to mail ballots. Such authorization shall be in the form of a Board resolution that sets forth the process and security safeguards for the collection of electronic ballots. In the event the Board adopts electronic ballots, then these Bylaws shall be read to replace or add, as the case may be, "mail" ballots with "electronic" ballots as set forth in the Board resolution. The electronic ballots must meet at least the standards for mail ballots set forth in this Section.

Section 4.7. Member Suggested Resolutions and New Business. Any Member or Members wishing to have a resolution or an item of business placed on the agenda of any meeting of Members to be discussed or acted upon at the meeting shall submit the resolution or other items in writing to the Secretary not less than sixty (60) days before the scheduled meeting date. Notice of such resolution or other item of business so presented shall be given to the Membership with the notice of meeting.

ARTICLE V
DIRECTORS

Section 5.1. General Powers and Responsibilities. The business and affairs of the Cooperative shall be managed by a board of five (5) Directors, which shall exercise all of the powers of the Cooperative except such powers that are, by Law or the Charter or Bylaws reserved to the Members.

Section 5.2. Director Conduct. A Director shall discharge the Director's duties, in good faith; in a manner the Director reasonably believes to be in the Cooperative's best interests; when becoming informed in connection with the Director's decision-making function or devoting attention to the Director's oversight function, with the care that an individual in a like position would reasonably believe appropriate under similar circumstances; and in a manner in which the Director discloses or causes to be disclosed to other Directors information not known by them, but known by the Director to be material to discharging their decision-making or oversight functions, except that disclosure is not required to the extent that the Director reasonably believes that disclosure would violate a duty imposed under law, a legally enforceable obligation of confidentiality, or a professional ethics rule.

Unless a Director has knowledge making reliance unwarranted, then in discharging the Director's duties, the Director may rely on the performance, information or statements, including financial statements, presented by any of the following individuals:

a. one or more Cooperative Officers or employees whom the Director reasonably believes to be reliable and competent in the functions performed or the information, opinions, reports, or statements provided;
b. legal counsel, public accountants, or other individuals retained by the Cooperative regarding matters involving skills or expertise the Director reasonably believes are matters within the individual's professional or expert competence and as to which the individual merits confidence; and
c. a Board Committee of which the Director is not a member if the Director reasonably believes the Board Committee merits confidence.

Section 5.3. Qualifications. To become and remain a Director of the Cooperative, a Person must meet and maintain continuously each of the following qualification requirements (collectively, the "Director Qualifications"):

1. Not be a close relative of an incumbent Director or an employee of the Cooperative.
2. Not be in any way financially interested in a competing enterprise that distributes electric energy.

3. Not have been convicted of a felony or any misdemeanor involving moral turpitude.
4. Be a citizen of the United States of America.
5. Be legally competent and physically able to enter contracts and exercise a Director's legal duties at the time of election and continuously during the Director's term of office.

Section 5.4. Disqualification of Nominees, Candidates and Directors.

1. The Credentials and Elections Committee shall determine whether nominees and candidates for Director are qualified through education or experience to assist the Board in governing the Cooperative.

2. If any Member alleges in a written statement signed by the Member and containing specific facts that a sitting Director does not meet any one or more of the Director Qualifications at a time after the Director's election, it shall be the duty of the Board to determine the validity of the such allegations according to the following procedures:
   a. Upon a majority vote of the Board that a Director is likely to have become disqualified, the Chairman of the Board shall notify the Director in writing of the basis for disqualification and provide the person an opportunity for a hearing before the Board. The Director must demand a hearing no later than the close of business on the tenth (10th) business day after the Director receives the notice or the notice is confirmed delivered to the Director's e-mail or physical address on file with the Cooperative, whichever is sooner. Failure to demand a hearing pursuant to this section shall mean that the Director has waived his or her right to a hearing.
   b. All disqualification hearings procedures shall adhere to Chapter XX, Disciplinary Proceedings, as set forth in Roberts Rules of Order, Newly Revised, except as otherwise stated herein. d. After the hearing, if held, or at a regular or special meeting if a hearing is not demanded, the members of the Board shall vote on whether the subject Director is disqualified. A two-thirds majority favoring disqualification shall affect the immediate removal of the person as Director. After removal, the Director's seat shall be treated as if it were vacant. If the Director is not removed, his Director Qualifications can be challenged again only through a new allegation of facts substantially different from the facts contained in the prior allegation.
   c. The decision of the Board is final.

3. If a majority of Directors authorized by these Bylaws complies with the Director Qualifications and approves a Board action, then the failure of a Director to comply with the Director Qualifications does not affect the Board action.

Section 5.5. Elections.

1. At each annual meeting of the Members, Directors shall be elected by secret mailed-in ballot by the Members.
2. Directors shall be elected by a plurality vote of the Members.
3. Cumulative voting shall not be allowed.

Section 5.6. Tenure. Directors shall be elected for terms of three (3) years or until their successors are elected and take office. The Board shall ensure staggered Director terms by dividing the total number of authorized Directors into groups of approximately equal number. Members must annually elect an approximately equal number of Directors. Directors shall take office at the first regular meeting of the Board following the annual meeting of the membership.

Section 5.7. Nominations. The Credentials and Elections Committee shall approve nominations, and shall

a. (60) days before the meeting a list of nominations for Directors to be elected;
b. The list may include a brief biography or statement provided by the nominee or candidate.
c. If any nominee or candidate withdraws his name from nomination or dies between the time he or she is nominated as provided herein and sixty (60) days before the deadline for returning ballots to the Cooperative, and if as a result of such withdrawal or death there is less than one (1) candidate for election for any seat, the Credentials and Elections Committee shall nominate someone else to take the place of such withdrawn or deceased nominee.

Section 5.8. Voting for Directors. For purposes of electing Directors, each Member who is a Member of the Cooperative on the day thirty (30) days before the annual Membership meeting or any special meeting of the Members called for the purpose of electing Directors shall be entitled to cast one vote. Ballots marked in violation of this restriction shall be invalid and shall not be counted. An invalid ballot shall not affect in any manner whatsoever the validity of any action taken by the Board after the election of Directors.

Section 5.9. Attendance at Board Meetings. By operation of these Bylaws and without any need for action by the Board, any Director who misses more than three (3) regular meetings in any twelve-month period shall automatically be removed from office and his or her seat on the Board shall be declared vacant.

Section 5.10. Director Resignation. A Director may resign at any time by delivering written notice of resignation to the Chairman. A resigning Director may request that the resignation be effective at a future date, which the Board may grant or deny in its sole discretion.

Section 5.11. Removal of Directors by Members. Any Member may bring one or more charge(s) for grossly negligent, fraudulent or criminal act, or omission significantly and adversely affecting the Cooperative against any one or more Director(s) and may request the removal of such Director(s) by reason thereof by filing with the Chairman such charge(s) in writing, together with a petition signed by not less than twenty-five percent (25%) of the then-total Members of the Cooperative which petition shall call for a special meeting, the stated purpose of which shall be to hear and act upon such charge(s) and, if one or more Directors are recalled, to elect their successor(s), and which specifies the place, time and date thereof not sooner than forty (40) days nor more than eighty (80) days after filing of such petition, or which requests that the matter be acted upon at the subsequent annual Member meeting if such meeting will be held no sooner than forty (40) days nor more than eighty (80) days after the filing of such petition. Each page of the

petition shall, in the forepart thereof, state the name(s) and address(es) of the Member(s) filing such charge(s), a verbatim statement of such charge(s) and the name(s) of the Director(s) against whom such charge(s) is (are) being made. The petition shall be signed by each Member in the same name as he is billed by the Cooperative and shall state the signatory's address as the same appears on such billings. Notice of such charge(s), verbatim, of the Director(s) against whom the charge(s) have been made and of the Member(s) filing the charge(s) and the purpose of the meeting shall be contained in the notice of the meeting, or separately noticed to the Members not less than fourteen (14) days prior to the Member meeting at which the matter will be acted upon.

Such Director(s) shall be informed in writing of the charges after they have been validly filed and at least twenty (20) days prior to the meeting of the Members at which the charges are to be considered, and shall have an opportunity at the meeting to be heard in person, by witnesses, by counsel, or any combination of such, and to present evidence in respect of the charge(s); and the Member(s) bringing the charges shall have the same opportunity, but must be heard first. The question of the removal of such Director(s) shall, separately for each if more than one has been charged, be considered and voted upon at such meeting, and any vacancy created by such removal shall be filled by vote of the Members at such meeting without compliance with the foregoing provisions with respect to nominations, except that nominations shall be made from the floor. The question of the removal of a Director shall not be voted upon at all unless some evidence in support of the charge(s) against him or her are presented during the meeting through oral statements, documents or otherwise. Any Director elected by the Members as a replacement for a removed Director shall meet all eligibility requirements for being a Director and shall serve the unexpired portion of the removed Director's term. No Director may be removed for lawfully opposing or resisting any transfer of Cooperative assets.

Section 5.12. Vacancies. Subject to the provisions of these Bylaws with respect to the filling of vacancies caused by the removal of a Director by the Members, a vacancy occurring in the Board shall be filled by the affirmative vote of a majority of the remaining Directors. A Director thus elected shall fill the unexpired term of the Director whose office was originally vacated.

Section 5.13. Compensation; Expenses. A Director is not an employee of the Cooperative. However, as determined or approved by the Board, the Cooperative may reimburse, compensate, pay a salary to, and provide various benefits to Directors for their service and for attending a: (1) Board meeting; (2) function, meeting, or event involving or relating to the Cooperative; or (3) function, meeting, or event involving, relating to, or reasonably enhancing the Director’s ability to serve in, the role of Director. The Board must determine or approve the manner, method, and amount of any Director reimbursement, compensation, salary, or benefits.

Section 5.14. Rules, Regulations, Rate Schedules and Contracts. The Board shall have power to make, adopt, amend, abolish and promulgate such rules, regulations, rate schedules and contracts, not inconsistent with Law or the Cooperative's Charter or Bylaws, as it may deem advisable for the management, administration and regulation of the business and affairs of the Cooperative.

Section 5.15. Accounting System and Report. The Board shall cause to be established a complete accounting system of the Cooperative's financial operations and condition, and may, after

the close of each fiscal year, cause to be made a full, complete and independent audit of the Cooperative's accounts, books and records reflecting operations during and financial condition as of the end of such year.

ARTICLE VI
MEETINGS OF DIRECTORS

Section 6.1. Regular Board Meetings. The Board shall regularly meet at the date, time, and location determined by the Board ("Regular Board Meeting") through a resolution. Once the resolution establishing the Regular Board Meeting schedule is adopted, the Board may hold Regular Board Meetings without further notice. For good cause, the Chairman may change the date, time, or location of a Regular Board Meeting.

Section 6.2. Special Board Meetings. The Board, the Chairman, the President, or at least two Directors may call a special meeting of the Board ("Special Board Meeting") by instructing the Cooperative to provide each Director at least five days prior written or Electronic notice indicating the date, time, location, and purpose of the Special Board Meeting. Special Board Meetings may also be held via telephone conference call or via zoom or similar service.

Section 6.3. Waiver of Board Meeting Notice. At any time before, during, or after a Board Meeting or Special Board Meeting, a Director may waive notice of such meeting by delivering to the Cooperative a written or Electronic waiver of notice signed by the Director and later filed with the Board Meeting minutes or the Cooperative's records. In addition, a Director's attendance at, or participation in, a Board Meeting waives notice of the Board Meeting and any matter considered at the Board Meeting, unless the Director:

1. at the beginning of the Board Meeting objects to holding or transacting business at the Board Meeting or lack of, or defective, notice of the Board Meeting or Special Board Meeting; and

2. does not vote for, or assent to, an objected matter.

Section 6.4. Quorum. The presence of a majority of the Directors in office shall be required for the transaction of business and the affirmative votes of a majority of the Directors in office shall be required for any action to be taken. A Director who by Law or by these Bylaws is disqualified from voting on a particular matter shall not, with respect to consideration of and action upon that matter, be counted in determining the number in office. A Director may not vote by proxy. An agreement signed by Directors providing the manner in which a Director must vote is not valid and is unenforceable. If less than a quorum is present at a meeting, a majority of the Directors present may recess the meeting until a later date, but shall cause any absent Directors to be duly notified of the time and place of such recessed meeting.

Section 6.5. Procedures for Board Meetings. Except as otherwise provided in these Bylaws, a Regular Board Meeting or Special Board Meeting (collectively, a "Board Meeting") may implement those meeting procedures the Board deems most appropriate. A Board Meeting or a

Board Committee meeting may be conducted with physically absent Directors participating, and deemed present in person, through any means of communication by which all Directors participating in the Board Meeting may simultaneously hear each other during the Board Meeting.

Without a Board Meeting, the Board may take an action required or permitted to be taken at a Board Meeting by "Director Written Consent" if the action is: (1) taken by all Directors; and (2) evidenced by one or more written consents ("Director Written Consent") (A) describing the action taken; (B) signed by each Director; (C) delivered to the Cooperative; and (D) included with the Cooperative's Board Meeting minutes. Except as a different effective date is provided in the Director Written Consent, action taken by Director Written Consent is effective when the last Director signs the Director Written Consent. A Director Written Consent has the effect of, and may be described as, a Board Meeting vote. Prior to his or her assent to a Director Written Consent, a Director may object for any reason and thereby refuse to allow the Director Written Consent to become effective. If the Chairman is not present at a Board Meeting, then the Directors attending the Board Meeting must elect a Director to preside over the Board Meeting.

The Board may promulgate or approve rules, policies, and procedures regarding:

1. The conduct of Board Meetings.

2. The attendance at, participation in, or presentation during Board Meetings by persons other than Directors; or

3. The right to access, inspect, or copy any minutes, record, or other document relating to any Board Meeting by persons other than Directors; or

Section 6.6. Committees. The Board may create a committee of the Board ("Board Committee") and appoint Directors to serve on the Board Committee. A Board Committee must consist of at least one Director. The Board may create a committee of the Members ("Member Committee") and appoint Members, including Directors, to serve on the Member Committee. The Board may appoint one or more Directors or Members, respectively, as alternate members of any Board or Member Committee to replace any absent or disqualified Committee member during the Committee member's absence or disqualification. A Member Committee may act as specified by the Board, but may not exercise Board authority. Except as otherwise provided in this Bylaw, the Board may authorize a Board Committee to exercise Board authority. Although a Board Committee may recommend, a Board Committee may not act, to: (1) retire and pay debts and leases; (2) approve the Cooperative's dissolution or merger, or the sale, pledge, or Transfer of all, or substantially all, Cooperative Assets; (3) elect, appoint, disqualify, or remove a Director, or fill a Board or Board Committee vacancy; or (4) adopt, amend, or repeal Bylaws.

ARTICLE VII
OFFICERS

Section 7.1 Officer Standard of Conduct. An Officer shall discharge the Officer's duties: (1) in good faith; (2) with the care an ordinarily prudent person in a like position would exercise under

similar circumstances; and (3) in a manner the Officer reasonably believes to be in the Cooperative's best interests. An Officer shall: (1) inform the Board, or the superior Officer or Board Committee to whom or which the Officer reports, of information regarding the Cooperative's affairs known to the Officer, within the scope of the Officer's duties and functions, and known to the Officer to be material to the superior Officer or Board; and (2) inform the Board, the superior Officer to whom the Officer reports, or another appropriate person within Cooperative of any actual or probable material violation of Law involving the Cooperative, or material breach of duty to the Cooperative by a Cooperative Officer, employee, or agent, that the Officer believes has occurred or is likely to occur.

Section 7.2. Required Officers; Other Officers; Election; Terms. The Cooperative must have at least a President (or Manager or General Manager), Secretary, and a Treasurer ("Required Officers"). The Board may create other executive officers that it deems appropriate. The Board shall elect Required Officers: (1) at the first Regular Board Meeting following each annual Member meeting, or as soon after each annual Member meeting as reasonably possible and convenient and (2) by affirmative vote of a majority of Directors in office. The Board may create or appoint Other Officers at any time. The Board may authorize a Required Officer to delegate duties and responsibilities to a third party with expertise in that area.

Section 7.3. Removal. Any officer, agent or employee elected or appointed by the Board may be removed by the Board whenever in its judgment the best interests of the Cooperative will thereby be served.

Section 7.4. Vacancies. A vacancy in any office elected by the Board may be filled by the Board for the unexpired portion of the term.

Section 7.5. President. The President may also be referred to as the Manager or General Manager. The President:

1. May sign Member Agreements, any deeds, mortgages, deeds of trust, notes, bonds, contracts or other instruments authorized by the Board to be executed, except in cases in which the signing and execution thereof shall be expressly delegated by the Board or by these Bylaws to some other officer or agent of the Cooperative, or shall be required by law to be otherwise signed or executed; and

2. In general, shall perform all duties incidental to the office of President and such other duties as may be prescribed by the Board from time to time.

Section 7.6. Secretary. Except as otherwise provided by the Board or these Bylaws, the Secretary:

1. shall be responsible for preparing, or supervising the preparation of, minutes of Board and Member meetings;
2. shall be responsible for maintaining and authenticating the Cooperative's records;
3. may affix the Cooperative's seal to a document authorized or approved by the Board or Members; and

4. shall perform all other duties, shall have all other responsibilities, and may exercise all other authority prescribed by the Board.

Section 7.7 Treasurer. Except as otherwise provided by the Board or these Bylaws, the Treasurer shall perform all duties, shall have all responsibility, and may exercise all authority that may be prescribed by the Board.

Section 7.8. Delegation of Secretary's and Treasurer's Responsibilities. Notwithstanding the duties, responsibilities and authorities of the Secretary and of the Treasurer hereinbefore provided in this Article, the Board by resolution may, except as otherwise limited by Law or these Bylaws, delegate, wholly or in part, the responsibility and authority for, and the regular or routine administration of, one or more of such officers, such duties to one or more Cooperative employees or subcontractors. To the extent that the Board does so delegate with respect to either such officer, that officer as such shall be released from such duties, responsibilities and authorities.

Section 7.9. Compensation. The compensation, if any, of any officer, agent or employee shall be fixed or set according to a plan approved by the Board.

Section 7.10. Reports. The officers of the Cooperative shall annually submit to the Members reports covering the business of the Cooperative for the previous fiscal year and showing the financial condition of the Cooperative at the close of such fiscal year.

Section 7.11. Indemnification. The Cooperative shall indemnify present and former Directors, officers, agents and employees against liability to the extent that their acts or omissions constituting the grounds for alleged liability were performed in their official capacity and, if actionable at all, were based upon good faith business judgments in the belief the acts or omissions were in the best interests of the Cooperative or were not against the best interest of the Cooperative. The Cooperative may purchase insurance to cover such indemnification.

ARTICLE VIII
CONTRACTS, CHECKS AND DEPOSITS

Section 8.1. Contracts. Except as otherwise provided in these Bylaws, the Board may authorize any officer or officers, agent or agents to enter into any Member Agreement or other contract or execute and deliver any instrument in the name and on behalf of the Cooperative, and such authority may be general or confined to specific instances.

Section 8.2. Checks, Drafts, etc. All checks, drafts or other orders for the payment of money, and all notes, bonds or other evidences of indebtedness issued in the name of the Cooperative shall be signed by such officer, officers, agent or agents, employee or employees of the Cooperative and in such manner as shall from time to time be determined by resolution of the Board.

Section 8.3. Deposits. All funds of the Cooperative shall be deposited from time to time to the credit of the Cooperative in such bank, banks, or other financial institutions as the Board may select. The Board may delegate to an officer of the Cooperative the authority to effectuate such deposits and to manage Cooperative funds and deposits in the best interest of the Cooperative,

such delegation being consistent with the Board's fiduciary duties and standard of conduct set forth in Section 5.2.

ARTICLE IX
NON-PROFIT OPERATION

Section 9.1. Interest or Dividends on Capital Prohibited. The Cooperative shall at all times be operated on a cooperative non-profit basis for the mutual benefit of its patrons. The term "Patron" means: a Member or any Person to whom the Cooperative is obligated to allocate Capital Credits, especially for obligations which exist before the Cooperative begins receiving payment for the Cooperative Service. No interest or dividends shall be paid or payable by the Cooperative on any capital furnished by its patrons.

Section 9.2. Patronage Capital in Connection with Furnishing Electric Energy. The Cooperative's operations in furnishing supplemental electric energy shall be conducted so that all Patrons who furnish capital or who provide for the lease of capital assets for the Cooperative receive a Capital Credit. In order to induce patronage and to assure that the Cooperative will operate on a non-profit basis, the Cooperative is obligated to account on a patronage basis to its Patrons for all amounts received and receivable from the furnishing of electric energy in excess of operating costs and expenses properly chargeable against the furnishing of electric energy. All such amounts in excess of operating costs and expenses at the moment of receipt by the Cooperative are received with the understanding that they are furnished by the Patrons as capital. The Cooperative is obligated to pay by credits to a capital account for each patron all such amounts in excess of operating costs and expenses. The books and records of the Cooperative shall be set up and kept in such a manner that at the end of each fiscal year the amount of capital, if any, so furnished by each Patron is clearly reflected and credited in an appropriate record to the capital account of each Patron. The Cooperative shall within a reasonable time after the close of the fiscal year notify each Patron of the amount of capital so credited to its capital account. All such amounts credited to the capital account of any patron shall have the same status as though they had been paid to the patron in cash in pursuance of a legal obligation to do so, and the patron had then furnished the Cooperative corresponding amounts for capital. Other than operating margins, funds and amounts received by the Cooperative that exceed the Cooperative's costs and expenses (also known as non-operating margins-interest) may be allocated as Capital Credits to Patrons in the same manner as the Cooperative allocates operating margins to Patrons, retained or used by the Cooperative as permanent, non-allocated capital, used to pay or offset any Cooperative cost or expense, or used as otherwise determined or approved by the Board.

The term "Capital Credits" means the amounts allocated to a Patron and contributed by the Patron to the Cooperative as capital. Consistent with these Bylaws, the allocation of Capital Credits is in the discretion of the Board and the Board must determine the manner, method, and timing of allocating Capital Credits. The Cooperative may use or invest unretired Capital Credits as determined by the Board. The Patron authorizes the Cooperative to perfect its security interest by filing a financing statement. Through a security agreement signed or authenticated by a Patron, the Patron may grant the Cooperative a security interest in Capital Credits allocated to the Patron and authorize the Cooperative to perfect the security interest. The Board shall have the power to adopt rules providing for the separate treatment of that portion (that is, power supply or other

service or supply portion) of capital credited to the accounts of patrons which corresponds to capital credited to the account of the Cooperative by an organization furnishing electric service or any other service or supply to the Cooperative. Such rules shall;

1. Establish a method for determining the portions of such capital credited to each patron for each applicable fiscal year;

2. Provide for separate identification on the Cooperative's books of such portions of capital credited to the Cooperative's patrons;

3. Provide for appropriate notifications to patrons with respect to such portions of capital credited to their accounts; and,

4. Preclude a general retirement of such portions of capital credited to patrons for any fiscal year prior to the general retirement of other capital credited to patrons for the same year or of any capital credited to patrons for any prior fiscal year.

In the event of dissolution or liquidation of the Cooperative, after all outstanding indebtedness of the Cooperative shall have been paid, outstanding Capital Credits shall be retired without priority on a pro rata basis before any payments are made on account of property rights of Members. If, at any time prior to dissolution or liquidation, the Board shall determine that the financial condition of the Cooperative will not be impaired thereby, the capital then credited to patrons' accounts may be retired in full or in part.

After operations begin, the Board shall determine the method, basis, priority and order of retirement, if any, for all amounts furnished as capital. Capital credited to the account of each patron shall be assigned only on the books of the Cooperative pursuant to written instructions from the assignor and only to successors in interest or successors in occupancy in all or a part of such patron's premises served by the Cooperative unless the Board acting under policies of general application, shall determine otherwise. Notwithstanding any other provision of these Bylaws, the Board, at its discretion, shall have the power at any time upon the death of any patron, who was a natural person, if the legal representatives of his estate shall request in writing that the capital credited to any such patron be retired prior to the time such capital would otherwise be retired under the provisions of these Bylaws, to retire capital credited to any such patron immediately upon such terms and conditions as the Board, acting under policies of general application, and the legal representatives of such patron's estate shall agree upon; provided, however, that the financial condition of the Cooperative will not be impaired thereby. If no legal representative has been appointed for the estate, an heir of the deceased may make the request and agreement upon such terms and conditions as the Board may prescribe. The Cooperative, before retiring any capital credited to any patron's account, shall deduct therefrom any amount owing by such patron to the Cooperative, together with interest thereon at the Tennessee legal rate on judgments in effect when such amount became overdue, compounded annually.

Patrons or legal representatives of the estates of patrons may elect to contribute all or a part of the capital credits to the Cooperative or, if formed in the future, to the Community Services Cooperative Foundation of Jackson. Such election will be made in writing. The patrons of the

Cooperative, by dealing with the Cooperative, acknowledge that the terms and provisions of the Charter and Bylaws shall constitute and be a contract between the Cooperative and each patron, and both the Cooperative and the patrons are bound by such contract, as fully as though each patron had individually signed a separate instrument containing such terms and provisions.

ARTICLE X
PAYMENT OF EXPENSES, ETC. IN SELLOUT DELIBERATIONS

In the event that an officer, Director, Member or group of Members shall incur any reasonable expenses, costs, and/or attorney's fees in connection with any mailing publications, membership meeting, or litigation opposed to buying or selling the business or all or substantially all of the assets of the Cooperative, and provided such expenses, costs and/or fees have not been or are not to be reimbursed or paid by any other person, firm, association or corporation, such costs, expenses and fees shall be paid by the Cooperative provided they were incurred in opposition to such proposal.

ARTICLE XI
WAIVER OF NOTICE

Any Member or Director may waive, in writing, any notice of meetings required to be given by these Bylaws. Personal attendance at any meeting of the Members or Directors shall constitute a waiver of notice of such meeting unless such personal attendance shall be for the express purpose of objecting to the transaction of any business on the ground that the meeting shall not have been lawfully called or convened. Any Member or Director attending any meeting for the purpose of making such objection shall notify the Secretary prior to or at the beginning of the meeting of his objections. Waiver of Director meetings is also subject to Section 6.3.

ARTICLE XII
DISPOSITION & PLEDGING OF PROPERTY; DISTRIBUTION OF SURPLUS ASSETS ON DISSOLUTION

Section 12.1. Transfer of Cooperative Assets. Except for any sale, lease, exchange, or other disposition ("Transfer") of any Cooperative property or Cooperative asset ("Asset"):

1. To secure indebtedness;

2. Pursuant to condemnation or threat of condemnation;

3. Pursuant to an existing legal obligation;

4. Associated with a consolidation or merger;

5. To another entity operating on a cooperative basis and providing electric energy; or,

6. To a Cooperative subsidiary, the Cooperative shall not transfer, during any twelve (12) month period, more than ten per centum (10%) of the Cooperative's assets unless:

a. At the expense of the person seeking to purchase, lease or acquire the Cooperative's assets, the Board appoints three (3) independent appraisers, each of whom, within a reasonable time of appointment, evaluates and renders an appraisal valuing the Cooperative's assets specified in the proposed transfer ("Appraisal");

b. Within a reasonable time of receiving the appraisals, the Cooperative invites any other entities operating on a cooperative basis, providing electric energy, and primarily located within the same state as, or within a state adjacent to, the state in which the Cooperative is primarily located to submit proposals to purchase, lease, or acquire the Cooperative's assets specified in the proposed transfer, or to merge or consolidate with the Cooperative;

c. The Board approves the proposed transfer;

d. By mail ballot, at least three-fourths (3/4) of the total Membership approves the proposed transfer; and

e. Notice of any Member meeting at which Members will consider the proposed transfer states that one of the purposes of the Member meeting is to consider the transfer, and includes a copy or summary of the proposed transfer.

In proportion to the value or quantity of Cooperative services used by Members during the period in which the Cooperative owned a Cooperative asset, the Cooperative allocates and credits to Members as Capital Credits any consideration received for the Cooperative's assets that exceed the amount paid for the Cooperative assets. Unless otherwise determined by the Members, after the Members approve a transfer, the Board may abandon the transfer. To secure indebtedness, the Board may transfer, mortgage, pledge, dedicate to repayment, or encumber any Cooperative asset.

Section 12.2. Distribution of Surplus Assets on Dissolution. Upon the Cooperative's dissolution, any assets remaining after all liabilities or obligations of the Cooperative have been satisfied and discharged shall be distributed among all persons who shall have been Members of the Cooperative at any time during the fiscal year in which such dissolution is authorized by vote of the Members or any of the five (5) next preceding years, prorated to them on the basis that their respective patronage during all such years bears to the total receipts of the Cooperative for all such years. Provided, however, that if in the judgment of the Board the amount of such surplus is too small to justify the expense of making such distribution, the Board may, in lieu thereof, donate, or provide for the donation of, such surplus to one or more nonprofit charitable or educational organizations that are exempt from federal income taxation.

ARTICLE XIII
FISCAL YEAR

The Cooperative's fiscal year shall begin on the first day of the month of January of each year and end on the last day of the month of December following.

ARTICLE XIV
RULES OF ORDER

Parliamentary procedure at all meetings of the Members, of the Board, of any committee provided for in these Bylaws and of any other committee of the Members or Board which may from time to time be duly established shall be governed by the most recent edition of Robert's Rules of Order, except to the extent such procedure is otherwise determined by Law or by the Cooperative's Governing Documents, or by action of the Board.

ARTICLE XV
SEAL

The corporate seal, if one is established, of the Cooperative shall be in the form of a circle and shall have inscribed thereon the name of the Cooperative and the words “Corporate Seal, Tennessee.”

ARTICLE XVI
LEGAL FORMALITIES

These Bylaws are governed by, and are to be interpreted under the laws of the State of Tennessee and any proceedings or actions arising therefrom shall be brought in a forum of competent jurisdiction located therein. The Board reserves the right to amend the Bylaws of the Cooperative at any time and for any reason consistent with the purpose of the Cooperative. Such amendment may be adopted without prior notice to Members, and such amendment shall become binding on the Members automatically on the effective date of the amendment. The titles and headings of the Charter and Sections of these Bylaws are for convenience and reference only, and do not affect the interpretation of any Bylaw, Article, Section, or sub-section thereof. The failure of the Cooperative to assert any right or remedy provided by these Bylaws does not waive the right or remedy provided by these Bylaws. These Bylaws and the Member Agreement constitute the entire agreement between the Cooperative and the Members and supersede any prior or contemporaneous oral or written communication or representation. The invalidity of any Bylaw provision does not invalidate the remaining Bylaw provisions. In the event a provision of these Bylaws is found to be invalid, the remaining provisions are to be read in such a manner as to give the fullest effect to the entire document as if, to the extent legally possible, the invalid provision were valid.

ARTICLE XVII
AMENDMENTS

Except as otherwise provided in these Bylaws, these Bylaws may be adopted, amended, or repealed only by two-thirds of Directors present and entitled to vote at a regular or special meeting of the Board. Except as otherwise provided in a Bylaw Amendment, the Amendment is effective the day after the vote approving the Amendment. The Cooperative must notify Members of amended Bylaws at the annual meeting following the amendment.

Notice of a Board meeting at which Directors will consider a proposed Bylaw amendment

must: (1) state that the purpose or one of the purposes, of the Board meeting is to consider the proposed Bylaw amendment; and (2) contain, or be accompanied by, a copy or summary of the proposed Bylaw amendment. After notice of a proposed Bylaw amendment, the proposed Bylaw amendment may not be materially changed before the meeting at which the amendment will be considered.

_____
_____, Secretary

BYLAWS OF
COMMUNITY SERVICES COOPERATIVE OF JACKSON I

This version adopted February 1, 2021

ARTICLE I
GENERAL PROVISIONS

Section 1.1. Defined Terms. These Bylaws define certain words, phrases, and terms ("Defined Terms"). In general, Defined Terms are: (1) defined in a full sentence or part of a sentence; (2) capitalized, underlined, and enclosed within quotation marks when defined; (3) enclosed within parenthesis when defined in part of a sentence; and (4) capitalized when otherwise used in these Bylaws. Except as otherwise provided in these Bylaws and subject to the context requiring otherwise, Defined Terms have the meaning specified in the appropriate Bylaw.

Section 1.2 Law and Charter. These Bylaws are subject to Law and the Charter filed with the Tennessee Secretary of State ("Charter"). If, and to the extent that, a Bylaw conflicts with Law or the Charter, then the Law or Charter control. "Law" includes applicable (1) local, state, and federal statutes and regulations, and (2) legally binding contracts enforceable by or against the Cooperative, including the Member Agreement.

Section 1.4. Validity of Electronic Signatures. To the extent that Member Agreement or any other document between the Cooperative and the Members or Directors, is completed or transmitted by electronic means, the Member or Director agrees to be bound by federal and state laws and regulations governing the validity of such electronic signatures, and agrees that any such electronic transmission to or from the Member or Director satisfies any requirements imposed by the law that a document, notice, minutes or other communication be in writing. The Member or Director agrees that any document sent electronically to the Member or Director or former Member at the Member's last known electronic address is considered received on the date sent by the Cooperative.

ARTICLE II
MEMBERSHIP

Section 2.1. Eligibility Requirements. An Entity may become a member of the Cooperative if: (1) it signs a Member Agreement, and consumes supplemental electric energy furnished by the Cooperative (such person being a "Member" and the Member being in a "Membership"). A "Cooperative Service" is supplemental electric energy provided by the Cooperative. An "Entity" includes a domestic or foreign business or nonprofit corporation, limited liability company, or any agency or division of government. An applicant is eligible if the location it occupies

1. annually requires or is expected to annually require at least 1,000,000 kilowatt-hours (kWh) of electric energy; and

2. uses electric energy on a demand curve consistent with the Cooperative's requirements.

Section 2.2. Cooperative Membership. A Member shall: (1) comply with these Bylaws; (2) comply with any rules or regulations of the Cooperative; (3) provide and maintain a current mailing address and telephone number with the Cooperative; and (4) pay the Cooperative for the Cooperative Service. These Bylaws are a contract between the Cooperative and a Member. If a

Member fails to comply with the Bylaws or the Member Agreement, the Cooperative may suspend or terminate the Member or the Cooperative Service provided to the Member.

1. Each Member agrees to:
   a. Comply with the Bylaws;
   b. Comply with the Member Agreement and any rules established and approved in the Member Agreement;
   c. Pay dues of $10.00 per year.
   d. Pay for the Cooperative Services used at prices, rates, or amounts established in the Member Agreement.

2. The Member Agreement will be on a form provided by the Cooperative. The Member Agreement will require a review of the applicant's electric energy demand curve. There is no connection fee or deposit.

3. Unless the Member Agreement provides otherwise, if the Cooperative Service is not paid for within 30 days, the outstanding amount owed to the Cooperative bears a late fee at the monthly periodic rate of 1.5% (18% per annum) until paid in full.

4. In no event shall the responsibility of the Cooperative extend beyond the point of delivery. The Cooperative shall repair malfunctioning of Cooperative Equipment or any error occurring in the Cooperative's billing procedures.

Section 2.3. Acceptance into Membership. Upon complying with the requirements set forth in Section 2.2, an applicant shall be accepted into Membership in, and become eligible to receive supplemental electric energy provided by the Cooperative. If the Member is unable to abide by the Member Agreement and these Bylaws, then the person's Membership may be suspended or terminated by the Cooperative.

Section 2.4 Provision of Cooperative Services. The Cooperative shall use reasonable diligence to furnish its Members with adequate and dependable supplemental electric service. However, the Cooperative does not exist to replace the existing municipal electric service, unless the municipal electric service is not dependable. In case of emergency, or as requested by government or emergency officials or representatives, the Cooperative may interrupt the provision of Cooperative Services to Members.

Each Member shall pay for such purchases when they become due and payable in accordance with the Member Agreement and published rate classifications and rate schedules established by the Cooperative. A Member may have more than one service connection from the Cooperative. The Cooperative's accounting procedures will reflect both connections.

Section 2.5. Wiring of Premises; Responsibility for Wiring, Meter Tampering or Bypassing and for Damage to Cooperative Properties. Each Member shall cause all premises receiving electric service pursuant to its Membership to become and to remain wired in accordance with the specifications of the Tennessee Fire Insurance Underwriters Association, the National Electrical Code, any applicable state code or local government ordinances, and requirements of the Cooperative. The Cooperative will provide the Cooperative Service at a location agreed to with

the Member using Cooperative Equipment. A Member shall: (1) protect Cooperative Equipment; and (2) maintain any protective device or procedure to protect the connection. A Member shall not tamper with, alter, interfere with, damage, or impair Cooperative Equipment.

Section 2.6. Member Arbitration, Indemnification, and Liability. Whenever requested by the Cooperative, a Member shall:

(1) Submit a claim or dispute between the Member and the Cooperative regarding the Member Agreement or the Cooperative's provision of a Cooperative Service, or the Member's use of a Cooperative Service to mediation and arbitration and shall comply with an arbitration award according to the rules and procedures prescribed by the operative _____UNDER CONSIDERATION _____. A demand for arbitration shall be made within a reasonable time after the claim, dispute or other matter in question has arisen.

(2) Indemnify the Cooperative for, and hold the Cooperative harmless from, liabilities, damages, costs, or expenses, including reasonable attorney fees and legal expenses, incurred by the Cooperative, or by a Cooperative Director, Officer, employee, agent, or representative (collectively, "Cooperative Official"), and caused by the Member's negligence, gross negligence, or willful misconduct, or by the unsafe or defective condition of a location occupied by the Member that is not the fault of the Cooperative.

In general, a Member is not liable to third parties for the Cooperative's acts, debts, liabilities, or obligations solely because of Membership in the Cooperative. A Member may become liable to the Cooperative as provided in the Member Agreement or Bylaws or as otherwise agreed to by the Cooperative and the Member.

Section 2.7. Access. Each Member shall make available to the Cooperative a suitable site, as determined by the Cooperative, whereon to place the Cooperative's physical facilities for the furnishing and metering of electric service and shall permit the Cooperative's authorized employees, agents and independent contractors to have access thereto safely and without interference from any hostile source for inspection, maintenance, replacement, relocation, repair or disconnection of such facilities at all reasonable times. As part of the consideration for such service, each Member shall be the Cooperative's bailee of such facilities and shall accordingly desist from interfering with, impairing the operation of or causing damage to such facilities, and shall use its best efforts to prevent others from so doing.

Section 2.8. Member to Grant Property Rights to Cooperative. The Member Agreement shall grant the Cooperative a right-of-way, license or other grant or interest in Member property, under such lands owned, leased, mortgaged, by the Member to connect the Cooperative Service or for a Cooperative Purpose. In the event Member has a mortgage or lien on a property, the Member shall not use the mortgage or lien as a reason to object to the grant of property rights pursuant to this section. A "Cooperative Purpose" is: (1) installing, constructing, inspecting, monitoring, operating, repairing, maintaining, removing, relocating, upgrading, or replacing Cooperative Equipment; (2) clearing, trimming, removing, or managing any trees, bushes, brush, or other vegetation to run wire underground to the Member facility; (3) providing a Cooperative Service to

a Member; (4) monitoring, measuring, or maintaining a Cooperative Service provided to a Member; (5) authorizing, permitting, satisfying, or facilitating an obligation incurred, or right granted, by the Cooperative regarding use of Cooperative Equipment; or (6) safely, reliably, and efficiently providing a Cooperative Service to the Member.

Section 2.9. Energy Conservation. Member and Cooperative shall work together to enhance energy management, to more efficiently utilize electric energy, or to conduct energy usage research.

Section 2.10 Statement of Nondiscrimination. The Cooperative does not discriminate on the basis of race, color, national origin, sex, religion, age, or disability. The Cooperative encourages persons who believe they have been improperly discriminated against to contact the General Manager. Written discrimination complaints must be filed not later than 180 days from the date of the alleged discrimination.

ARTICLE III
MEMBERSHIP SUSPENSION AND TERMINATION

Section 3.1. Suspension.

1. Suspension Reasons. The Cooperative may suspend a Member for the following reasons ("Suspension Reasons"):
   a. Failing to comply with the Member Agreement of these Bylaws;
   b. For good cause if the Member legally dissolves, or legally ceases to exist; tampers with, alters, interferes with, damages, or impairs any Cooperative Equipment; or voluntarily requests suspension.

2. Notice and Comment. Unless otherwise provided in these Bylaws, and following the occurrence of a suspension reason other than a Member's voluntary request for suspension, the Cooperative:
   a. Provides the Member at least fifteen (15) days prior written notice of the Member's possible suspension and the underlying suspension reason; and
   b. Notifies the Member that the Member has, and allows the Member, at least five (5) days after the effective date of the notice to comment upon the suspension reason, either orally or in writing.

Any written suspension notice provided by mail must be mailed to the Member's most current address shown on the membership list.

3. Effect of Member suspension upon Cooperative. Upon a Member's suspension, then:
   a. The Cooperative's duties, obligations, and liabilities imposed by these Bylaws for the Member cease; and
   b. The Cooperative may cease providing any Cooperative services to the Member.
4. Effect of Member suspension upon Member. A suspended Member forfeits and relinquishes all rights provided in the Member Agreement and these Bylaws. In particular, a suspended Member forfeits and relinquishes any voting rights provided

by these Bylaws. A suspended Member, however, remains subject to all obligations imposed by the Member Agreement and these Bylaws.

5. Lifting of Suspension. A Member's suspension is automatically lifted upon the Member rectifying, to the Cooperative's reasonable satisfaction, the underlying suspension reason within ten (10) days of the suspension. The Manger may lift any Member suspension for good cause as determined by the Board.

Section 3.2. Termination. The membership of the Member shall be terminated without further action by the Cooperative unless the Member shall request in writing within thirty (30) days of the effective date of the suspension a hearing before the Board. The termination, but not the suspension, shall be held in abeyance until the Board votes on the termination. Termination of a Member does not release the Member from any debts, liabilities, or obligations owed the Cooperative. Upon a Member's termination from the Cooperative, and after deducting any amounts owed the Cooperative, the Cooperative shall return to the Member any amounts due to the terminated Members, if any, unless deemed otherwise for good cause by the Board.

Section 3.3. Termination by Withdrawal or Resignation. A Member shall withdraw from membership upon such generally applicable conditions as the Manager shall prescribe upon becoming ineligible under the provisions of Section 2.1 for membership in the Cooperative.

Section 3.4. Effect of Termination. Upon the termination in any manner of a Membership, the former Member shall be entitled to a refund of any over payment, less any amounts due the Cooperative. Should an action be commenced or an attorney employed to enforce payments of any amount owing on an account, the Member agrees, jointly and severally, to pay all costs of enforcement, including reasonable attorneys' fees and a late fee at the monthly periodic rate of 1.5% per month (18% per annum) until paid in full.

ARTICLE IV
MEETINGS OF MEMBERS

Section 4.1. Annual Meeting. For the purposes of electing Directors, hearing and passing upon reports covering the previous fiscal year, and transacting such other business as may properly come before the meeting, the annual meeting of the Members shall be held on such date and beginning at such time as the Board from year to year shall provide. It shall be the responsibility of the Board to make adequate plans and preparations for and to encourage Member attendance at the annual meeting. Failure to hold the annual meeting at the designated time shall not constitute a forfeiture or dissolution of the Cooperative. These meetings may be conducted over zoom or any other electronic media.

Section 4.2. Special Member Meetings. A special meeting of the Members may be called by resolution of the Board or upon written request of at least the greater of three Members or twenty-five percent (25%) of all the Members, signed and dated within thirty (30) days following the first signature. The Cooperative will give notice of the special meeting to all Members. The special meeting shall be held in Madison County, Tennessee on such date, and beginning at such hour as designated by the Members calling the special meeting.

Section 4.3. Notice of Member Meetings. Written notice of the place, date and hour of the meeting, and, in the case of a special meeting or of an annual meeting at which business requiring special notice is to be transacted, the purpose or purposes of the meeting, shall be delivered to each Member not less than fourteen (14) nor more than forty-five (45) days before the date of the meeting. Such notice may be made personally; by United States Postal Service either with or without other documents, or electronically at a verified Member e-mail address. No matter that requires the affirmative votes of a clear majority of the Cooperative's Members attending a Member meeting shall be acted upon unless notice of such matter shall have been contained in the notice of the meeting. If mailed, such notice shall be deemed to be delivered when deposited in the United States mail, addressed to the Member at his address as it appears on the Cooperative's records, with postage thereon prepaid and postmarked at least fourteen (14) days before the meeting date. If transmitted via e-mail, such notice shall be deemed delivered when transmitted to a previously verified e-mail address for Member. The inadvertent failure of any Member to receive such notice shall not invalidate any action which may be taken by the Members at any such meeting. In making time calculations required by this section, the day of the meeting shall not be counted.

Section 4.4. Quorum for Member Meetings. Whenever ballots are cast by Members for the election of a director, attendance in person, by proxy, or by the submission of mailed ballots of at least twenty-five percent (25%) of the total Members of the Cooperative at any meeting of the Members shall constitute a quorum for the purpose of electing Directors and conducting other Cooperative business. Once a quorum is established for election of Directors, the results of the vote for Directors may be announced. Once a quorum is established for conducting Cooperative business, all business may be transacted despite the loss of a quorum. If a quorum is not established, the chair may recess the meeting to another time and date to any place within Madison County. The Secretary of the Cooperative, or his designee, shall notify all Members of the time, place and date of the recessed meeting by delivering notice thereof as provided in Section 4.3 of these Bylaws. At all meetings of the Members, the Secretary shall annex to the meeting minutes or incorporate therein by reference, a list of those who were present in person, by mailed-in ballot and by proxy.

Section 4.5. Credentials and Elections Committee. The Board appoints a Credentials and Elections Committee consisting of an uneven number of person, not less than three (3) nor more than seven (7). Members of the Credentials and Elections Committee may not be close relatives or members of the same household of existing Directors or known candidates for Directors to be elected at such meeting. The Credentials and Elections Committee decides Member meeting issues. A Credentials and Elections Committee decision or action requires a vote of at least a majority of the Credentials and Elections Committee members present. Except as otherwise provided in these Bylaws, Credentials and Elections Committee decisions or actions during, or within a reasonable time before or after, a Member meeting are final. In the event a member of the Credentials and Elections Committee resigns or becomes unable to participate due to illness or death, the Board may appoint, in its sole discretion an alternate member. The Committee may elect its own chairperson. In the exercise of its responsibility, the Credentials and Elections Committee shall have available to it the advice of counsel provided by the Cooperative. The Credentials and Elections Committee shall certify the results of all elections and other balloting. It shall be the responsibility of the Credentials and Elections Committee to establish or approve the manner of conducting Member registration at a Member meeting, to pass upon all questions that may arise

with respect to the registration of Members in person and the authenticity and validity of mailed-in ballots and proxies, to oversee the counting of all ballots cast in any election, to rule upon all other questions that may arise relating to Member voting and the election of candidates for Director. The Credentials and Elections Committee's responsibilities include, but are not limited to, reviewing the process for the nomination and election of Directors and ruling on the validity of qualifications of candidates and nominees.

Section 4.6. Voting. Each Member who is not in a status of suspension as provided for in Section 3.1 shall be entitled to one vote and no more upon each matter submitted to a vote at a meeting of the Members. An Entity may vote through a duly designated representative, qualified as such upon registering for the meeting. Voting by Members shall be allowed upon the presentation to the Cooperative prior to, or upon registration at, each Member meeting of satisfactory evidence entitling the person to vote on behalf of the Entity. Such evidence shall not be required in any voting by mailed ballots for election of Directors. No one may vote on behalf of more than one Member. At all meetings of the Members at which a quorum is present all questions shall be decided by a majority of the Members voting thereon, except as otherwise provided by law or by the Cooperative's Charter or these Bylaws. Members may not accumulate their votes.

Members shall vote for the election of Directors by ballots mailed in or delivered to the address indicated in the notice of meeting on or before the date and hour indicated in such notice. Members shall not be permitted to vote in person for the election of Directors, but may attend and register and participate in all other proceedings of the meeting of Members to the fullest extent, and including the voting in person on all other questions that come before the meeting of Members. All elections of Directors shall be conducted so that the ballots will be return-mailed or delivered so as to assure that the way the vote is cast may not be determined and to assure that Members vote only once. The counting of mail ballots shall be conducted by or under the direction of the Credentials and Elections Committee prior to the meeting of the Members. The results will not be made official until certified by the Credentials and Elections Committee and announced by the chair of the Committee during the meeting. The provisions of the Section shall not apply to the election of a Director to fill a vacancy caused by the removal of a Director by the Members, in which case the provisions of Section 5.12 (Removal of Directors by Members) shall be followed.

The Board may authorize balloting by electronic means as an alternative to mail ballots or as replacement to mail ballots. Such authorization shall be in the form of a Board resolution that sets forth the process and security safeguards for the collection of electronic ballots. In the event the Board adopts electronic ballots, then these Bylaws shall be read to replace or add, as the case may be, "mail" ballots with "electronic" ballots as set forth in the Board resolution. The electronic ballots must meet at least the standards for mail ballots set forth in this Section.

Section 4.7. Member Suggested Resolutions and New Business. Any Member or Members wishing to have a resolution or an item of business placed on the agenda of any meeting of Members to be discussed or acted upon at the meeting shall submit the resolution or other items in writing to the Secretary not less than sixty (60) days before the scheduled meeting date. Notice of such resolution or other item of business so presented shall be given to the Membership with the notice of meeting.

ARTICLE V
DIRECTORS

Section 5.1. General Powers and Responsibilities. The business and affairs of the Cooperative shall be managed by a board of five (5) Directors, which shall exercise all of the powers of the Cooperative except such powers that are, by Law or the Charter or Bylaws reserved to the Members.

Section 5.2. Director Conduct. A Director shall discharge the Director's duties, in good faith; in a manner the Director reasonably believes to be in the Cooperative's best interests; when becoming informed in connection with the Director's decision-making function or devoting attention to the Director's oversight function, with the care that an individual in a like position would reasonably believe appropriate under similar circumstances; and in a manner in which the Director discloses or causes to be disclosed to other Directors information not known by them, but known by the Director to be material to discharging their decision-making or oversight functions, except that disclosure is not required to the extent that the Director reasonably believes that disclosure would violate a duty imposed under law, a legally enforceable obligation of confidentiality, or a professional ethics rule.

Unless a Director has knowledge making reliance unwarranted, then in discharging the Director's duties, the Director may rely on the performance, information or statements, including financial statements, presented by any of the following individuals:

a. one or more Cooperative Officers or employees whom the Director reasonably believes to be reliable and competent in the functions performed or the information, opinions, reports, or statements provided;
b. legal counsel, public accountants, or other individuals retained by the Cooperative regarding matters involving skills or expertise the Director reasonably believes are matters within the individual's professional or expert competence and as to which the individual merits confidence; and
c. a Board Committee of which the Director is not a member if the Director reasonably believes the Board Committee merits confidence.

Section 5.3. Qualifications. To become and remain a Director of the Cooperative, a Person must meet and maintain continuously each of the following qualification requirements (collectively, the "Director Qualifications"):

1. Not be a close relative of an incumbent Director or an employee of the Cooperative.
2. Not be in any way financially interested in a competing enterprise that distributes electric energy.
3. Not have been convicted of a felony or any misdemeanor involving moral turpitude.
4. Be a citizen of the United States of America.
5. Be legally competent and physically able to enter contracts and exercise a Director's legal duties at the time of election and continuously during the Director's term of office.

Section 5.4. Disqualification of Nominees, Candidates and Directors.

1. The Credentials and Elections Committee shall determine whether nominees and candidates for Director are qualified through education or experience to assist the Board in governing the Cooperative.

2. If any Member alleges in a written statement signed by the Member and containing specific facts that a sitting Director does not meet any one or more of the Director Qualifications at a time after the Director's election, it shall be the duty of the Board to determine the validity of the such allegations according to the following procedures:
   a. Upon a majority vote of the Board that a Director is likely to have become disqualified, the Chairman of the Board shall notify the Director in writing of the basis for disqualification and provide the person an opportunity for a hearing before the Board. The Director must demand a hearing no later than the close of business on the tenth (10th) business day after the Director receives the notice or the notice is confirmed delivered to the Director's e-mail or physical address on file with the Cooperative, whichever is sooner. Failure to demand a hearing pursuant to this section shall mean that the Director has waived his or her right to a hearing.
   b. All disqualification hearings procedures shall adhere to Chapter XX, Disciplinary Proceedings, as set forth in Roberts Rules of Order, Newly Revised, except as otherwise stated herein. d. After the hearing, if held, or at a regular or special meeting if a hearing is not demanded, the members of the Board shall vote on whether the subject Director is disqualified. A two-thirds majority favoring disqualification shall affect the immediate removal of the person as Director. After removal, the Director's seat shall be treated as if it were vacant. If the Director is not removed, his Director Qualifications can be challenged again only through a new allegation of facts substantially different from the facts contained in the prior allegation.
   c. The decision of the Board is final.

3. If a majority of Directors authorized by these Bylaws complies with the Director Qualifications and approves a Board action, then the failure of a Director to comply with the Director Qualifications does not affect the Board action.

Section 5.5. Elections.

1. At each annual meeting of the Members, Directors shall be elected by secret mailed-in ballot by the Members.
2. Directors shall be elected by a plurality vote of the Members.
3. Cumulative voting shall not be allowed.

Section 5.6. Tenure. Directors shall be elected for terms of three (3) years or until their successors are elected and take office. The Board shall ensure staggered Director terms by dividing the total number of authorized Directors into groups of approximately equal number. Members must annually elect an approximately equal number of Directors. Directors shall take office at the first regular meeting of the Board following the annual meeting of the membership.

Section 5.7. Nominations. The Credentials and Elections Committee shall approve nominations, and shall

a. (60) days before the meeting a list of nominations for Directors to be elected;
b. The list may include a brief biography or statement provided by the nominee or candidate.
c. If any nominee or candidate withdraws his name from nomination or dies between the time he or she is nominated as provided herein and sixty (60) days before the deadline for returning ballots to the Cooperative, and if as a result of such withdrawal or death there is less than one (1) candidate for election for any seat, the Credentials and Elections Committee shall nominate someone else to take the place of such withdrawn or deceased nominee.

Section 5.8. Voting for Directors. For purposes of electing Directors, each Member who is a Member of the Cooperative on the day thirty (30) days before the annual Membership meeting or any special meeting of the Members called for the purpose of electing Directors shall be entitled to cast one vote. Ballots marked in violation of this restriction shall be invalid and shall not be counted. An invalid ballot shall not affect in any manner whatsoever the validity of any action taken by the Board after the election of Directors.

Section 5.9. Attendance at Board Meetings. By operation of these Bylaws and without any need for action by the Board, any Director who misses more than three (3) regular meetings in any twelve-month period shall automatically be removed from office and his or her seat on the Board shall be declared vacant.

Section 5.10. Director Resignation. A Director may resign at any time by delivering written notice of resignation to the Chairman. A resigning Director may request that the resignation be effective at a future date, which the Board may grant or deny in its sole discretion.

Section 5.11. Removal of Directors by Members. Any Member may bring one or more charge(s) for grossly negligent, fraudulent or criminal act, or omission significantly and adversely affecting the Cooperative against any one or more Director(s) and may request the removal of such Director(s) by reason thereof by filing with the Chairman such charge(s) in writing, together with a petition signed by not less than twenty-five percent (25%) of the then-total Members of the Cooperative which petition shall call for a special meeting, the stated purpose of which shall be to hear and act upon such charge(s) and, if one or more Directors are recalled, to elect their successor(s), and which specifies the place, time and date thereof not sooner than forty (40) days nor more than eighty (80) days after filing of such petition, or which requests that the matter be acted upon at the subsequent annual Member meeting if such meeting will be held no sooner than forty (40) days nor more than eighty (80) days after the filing of such petition. Each page of the petition shall, in the forepart thereof, state the name(s) and address(es) of the Member(s) filing such charge(s), a verbatim statement of such charge(s) and the name(s) of the Director(s) against whom such charge(s) is (are) being made. The petition shall be signed by each Member in the same name as he is billed by the Cooperative and shall state the signatory's address as the same appears on such billings. Notice of such charge(s), verbatim, of the Director(s) against whom the charge(s) have been made and of the Member(s) filing the charge(s) and the purpose of the meeting shall be contained in the notice of the meeting, or separately noticed to the Members not

less than fourteen (14) days prior to the Member meeting at which the matter will be acted upon.

Such Director(s) shall be informed in writing of the charges after they have been validly filed and at least twenty (20) days prior to the meeting of the Members at which the charges are to be considered, and shall have an opportunity at the meeting to be heard in person, by witnesses, by counsel, or any combination of such, and to present evidence in respect of the charge(s); and the Member(s) bringing the charges shall have the same opportunity, but must be heard first. The question of the removal of such Director(s) shall, separately for each if more than one has been charged, be considered and voted upon at such meeting, and any vacancy created by such removal shall be filled by vote of the Members at such meeting without compliance with the foregoing provisions with respect to nominations, except that nominations shall be made from the floor. The question of the removal of a Director shall not be voted upon at all unless some evidence in support of the charge(s) against him or her are presented during the meeting through oral statements, documents or otherwise. Any Director elected by the Members as a replacement for a removed Director shall meet all eligibility requirements for being a Director and shall serve the unexpired portion of the removed Director's term. No Director may be removed for lawfully opposing or resisting any transfer of Cooperative assets.

Section 5.12. Vacancies. Subject to the provisions of these Bylaws with respect to the filling of vacancies caused by the removal of a Director by the Members, a vacancy occurring in the Board shall be filled by the affirmative vote of a majority of the remaining Directors. A Director thus elected shall fill the unexpired term of the Director whose office was originally vacated.

Section 5.13. Compensation; Expenses. A Director is not an employee of the Cooperative. However, as determined or approved by the Board, the Cooperative may reimburse, compensate, pay a salary to, and provide various benefits to Directors for their service and for attending a: (1) Board meeting; (2) function, meeting, or event involving or relating to the Cooperative; or (3) function, meeting, or event involving, relating to, or reasonably enhancing the Director’s ability to serve in, the role of Director. The Board must determine or approve the manner, method, and amount of any Director reimbursement, compensation, salary, or benefits.

Section 5.14. Rules, Regulations, Rate Schedules and Contracts. The Board shall have power to make, adopt, amend, abolish and promulgate such rules, regulations, rate schedules and contracts, not inconsistent with Law or the Cooperative's Charter or Bylaws, as it may deem advisable for the management, administration and regulation of the business and affairs of the Cooperative.

Section 5.15. Accounting System and Report. The Board shall cause to be established a complete accounting system of the Cooperative's financial operations and condition, and may, after the close of each fiscal year, cause to be made a full, complete and independent audit of the Cooperative's accounts, books and records reflecting operations during and financial condition as of the end of such year.

ARTICLE VI
MEETINGS OF DIRECTORS

Section 6.1. Regular Board Meetings. The Board shall regularly meet at the date, time, and location determined by the Board ("Regular Board Meeting") through a resolution. Once the resolution establishing the Regular Board Meeting schedule is adopted, the Board may hold Regular Board Meetings without further notice. For good cause, the Chairman may change the date, time, or location of a Regular Board Meeting.

Section 6.2. Special Board Meetings. The Board, the Chairman, the President, or at least two Directors may call a special meeting of the Board ("Special Board Meeting") by instructing the Cooperative to provide each Director at least five days prior written or Electronic notice indicating the date, time, location, and purpose of the Special Board Meeting. Special Board Meetings may also be held via telephone conference call or via zoom or similar service.

Section 6.3. Waiver of Board Meeting Notice. At any time before, during, or after a Board Meeting or Special Board Meeting, a Director may waive notice of such meeting by delivering to the Cooperative a written or Electronic waiver of notice signed by the Director and later filed with the Board Meeting minutes or the Cooperative's records. In addition, a Director's attendance at, or participation in, a Board Meeting waives notice of the Board Meeting and any matter considered at the Board Meeting, unless the Director:

1. at the beginning of the Board Meeting objects to holding or transacting business at the Board Meeting or lack of, or defective, notice of the Board Meeting or Special Board Meeting; and

2. does not vote for, or assent to, an objected matter.

Section 6.4. Quorum. The presence of a majority of the Directors in office shall be required for the transaction of business and the affirmative votes of a majority of the Directors in office shall be required for any action to be taken. A Director who by Law or by these Bylaws is disqualified from voting on a particular matter shall not, with respect to consideration of and action upon that matter, be counted in determining the number in office. A Director may not vote by proxy. An agreement signed by Directors providing the manner in which a Director must vote is not valid and is unenforceable. If less than a quorum is present at a meeting, a majority of the Directors present may recess the meeting until a later date, but shall cause any absent Directors to be duly notified of the time and place of such recessed meeting.

Section 6.5. Procedures for Board Meetings. Except as otherwise provided in these Bylaws, a Regular Board Meeting or Special Board Meeting (collectively, a "Board Meeting") may implement those meeting procedures the Board deems most appropriate. A Board Meeting or a Board Committee meeting may be conducted with physically absent Directors participating, and deemed present in person, through any means of communication by which all Directors participating in the Board Meeting may simultaneously hear each other during the Board Meeting.

Without a Board Meeting, the Board may take an action required or permitted to be taken at a Board Meeting by "Director Written Consent" if the action is: (1) taken by all Directors; and (2) evidenced by one or more written consents ("Director Written Consent") (A) describing the action taken; (B) signed by each Director; (C) delivered to the Cooperative; and (D) included with the Cooperative's Board Meeting minutes. Except as a different effective date is provided in the

Director Written Consent, action taken by Director Written Consent is effective when the last Director signs the Director Written Consent. A Director Written Consent has the effect of, and may be described as, a Board Meeting vote. Prior to his or her assent to a Director Written Consent, a Director may object for any reason and thereby refuse to allow the Director Written Consent to become effective. If the Chairman is not present at a Board Meeting, then the Directors attending the Board Meeting must elect a Director to preside over the Board Meeting.

The Board may promulgate or approve rules, policies, and procedures regarding:

1. The conduct of Board Meetings.

2. The attendance at, participation in, or presentation during Board Meetings by persons other than Directors; or

3. The right to access, inspect, or copy any minutes, record, or other document relating to any Board Meeting by persons other than Directors; or

Section 6.6. Committees. The Board may create a committee of the Board ("Board Committee") and appoint Directors to serve on the Board Committee. A Board Committee must consist of at least one Director. The Board may create a committee of the Members ("Member Committee") and appoint Members, including Directors, to serve on the Member Committee. The Board may appoint one or more Directors or Members, respectively, as alternate members of any Board or Member Committee to replace any absent or disqualified Committee member during the Committee member's absence or disqualification. A Member Committee may act as specified by the Board, but may not exercise Board authority. Except as otherwise provided in this Bylaw, the Board may authorize a Board Committee to exercise Board authority. Although a Board Committee may recommend, a Board Committee may not act, to: (1) retire and pay debts and leases; (2) approve the Cooperative's dissolution or merger, or the sale, pledge, or Transfer of all, or substantially all, Cooperative Assets; (3) elect, appoint, disqualify, or remove a Director, or fill a Board or Board Committee vacancy; or (4) adopt, amend, or repeal Bylaws.

ARTICLE VII
OFFICERS

Section 7.1 Officer Standard of Conduct. An Officer shall discharge the Officer's duties: (1) in good faith; (2) with the care an ordinarily prudent person in a like position would exercise under similar circumstances; and (3) in a manner the Officer reasonably believes to be in the Cooperative's best interests. An Officer shall: (1) inform the Board, or the superior Officer or Board Committee to whom or which the Officer reports, of information regarding the Cooperative's affairs known to the Officer, within the scope of the Officer's duties and functions, and known to the Officer to be material to the superior Officer or Board; and (2) inform the Board, the superior Officer to whom the Officer reports, or another appropriate person within Cooperative of any actual or probable material violation of Law involving the Cooperative, or material breach of duty to the Cooperative by a Cooperative Officer, employee, or agent, that the Officer believes has occurred or is likely to occur.

Section 7.2. Required Officers; Other Officers; Election; Terms. The Cooperative must have at least a President (or Manager or General Manager), Secretary, and a Treasurer ("Required Officers"). The Board may create other executive officers that it deems appropriate. The Board shall elect Required Officers: (1) at the first Regular Board Meeting following each annual Member meeting, or as soon after each annual Member meeting as reasonably possible and convenient and (2) by affirmative vote of a majority of Directors in office. The Board may create or appoint Other Officers at any time. The Board may authorize a Required Officer to delegate duties and responsibilities to a third party with expertise in that area.

Section 7.3. Removal. Any officer, agent or employee elected or appointed by the Board may be removed by the Board whenever in its judgment the best interests of the Cooperative will thereby be served.

Section 7.4. Vacancies. A vacancy in any office elected by the Board may be filled by the Board for the unexpired portion of the term.

Section 7.5. President. The President may also be referred to as the Manager or General Manager. The President:

1. May sign Member Agreements, any deeds, mortgages, deeds of trust, notes, bonds, contracts or other instruments authorized by the Board to be executed, except in cases in which the signing and execution thereof shall be expressly delegated by the Board or by these Bylaws to some other officer or agent of the Cooperative, or shall be required by law to be otherwise signed or executed; and

2. In general, shall perform all duties incidental to the office of President and such other duties as may be prescribed by the Board from time to time.

Section 7.6. Secretary. Except as otherwise provided by the Board or these Bylaws, the Secretary:

1. shall be responsible for preparing, or supervising the preparation of, minutes of Board and Member meetings;
2. shall be responsible for maintaining and authenticating the Cooperative's records;
3. may affix the Cooperative's seal to a document authorized or approved by the Board or Members; and

4. shall perform all other duties, shall have all other responsibilities, and may exercise all other authority prescribed by the Board.

Section 7.7 Treasurer. Except as otherwise provided by the Board or these Bylaws, the Treasurer shall perform all duties, shall have all responsibility, and may exercise all authority that may be prescribed by the Board.

Section 7.8. Delegation of Secretary's and Treasurer's Responsibilities. Notwithstanding the duties, responsibilities and authorities of the Secretary and of the Treasurer hereinbefore provided in this Article, the Board by resolution may, except as otherwise limited by Law or these Bylaws, delegate, wholly or in part, the responsibility and authority for, and the regular or routine

administration of, one or more of such officers, such duties to one or more Cooperative employees or subcontractors. To the extent that the Board does so delegate with respect to either such officer, that officer as such shall be released from such duties, responsibilities and authorities.

Section 7.9. Compensation. The compensation, if any, of any officer, agent or employee shall be fixed or set according to a plan approved by the Board.

Section 7.10. Reports. The officers of the Cooperative shall annually submit to the Members reports covering the business of the Cooperative for the previous fiscal year and showing the financial condition of the Cooperative at the close of such fiscal year.

Section 7.11. Indemnification. The Cooperative shall indemnify present and former Directors, officers, agents and employees against liability to the extent that their acts or omissions constituting the grounds for alleged liability were performed in their official capacity and, if actionable at all, were based upon good faith business judgments in the belief the acts or omissions were in the best interests of the Cooperative or were not against the best interest of the Cooperative. The Cooperative may purchase insurance to cover such indemnification.

ARTICLE VIII
CONTRACTS, CHECKS AND DEPOSITS

Section 8.1. Contracts. Except as otherwise provided in these Bylaws, the Board may authorize any officer or officers, agent or agents to enter into any Member Agreement or other contract or execute and deliver any instrument in the name and on behalf of the Cooperative, and such authority may be general or confined to specific instances.

Section 8.2. Checks, Drafts, etc. All checks, drafts or other orders for the payment of money, and all notes, bonds or other evidences of indebtedness issued in the name of the Cooperative shall be signed by such officer, officers, agent or agents, employee or employees of the Cooperative and in such manner as shall from time to time be determined by resolution of the Board.

Section 8.3. Deposits. All funds of the Cooperative shall be deposited from time to time to the credit of the Cooperative in such bank, banks, or other financial institutions as the Board may select. The Board may delegate to an officer of the Cooperative the authority to effectuate such deposits and to manage Cooperative funds and deposits in the best interest of the Cooperative, such delegation being consistent with the Board's fiduciary duties and standard of conduct set forth in Section 5.2.

ARTICLE IX
NON-PROFIT OPERATION

Section 9.1. Interest or Dividends on Capital Prohibited. The Cooperative shall at all times be operated on a cooperative non-profit basis for the mutual benefit of its patrons. The term "Patron" means: a Member or any Person to whom the Cooperative is obligated to allocate Capital Credits, especially for obligations which exist before the Cooperative begins receiving payment for the Cooperative Service. No interest or dividends shall be paid or payable by the Cooperative on any capital furnished by its patrons.

Section 9.2. Patronage Capital in Connection with Furnishing Electric Energy. The Cooperative's operations in furnishing supplemental electric energy shall be conducted so that all Patrons who furnish capital or who provide for the lease of capital assets for the Cooperative receive a Capital Credit. In order to induce patronage and to assure that the Cooperative will operate on a non-profit basis, the Cooperative is obligated to account on a patronage basis to its Patrons for all amounts received and receivable from the furnishing of electric energy in excess of operating costs and expenses properly chargeable against the furnishing of electric energy. All such amounts in excess of operating costs and expenses at the moment of receipt by the Cooperative are received with the understanding that they are furnished by the Patrons as capital. The Cooperative is obligated to pay by credits to a capital account for each patron all such amounts in excess of operating costs and expenses. The books and records of the Cooperative shall be set up and kept in such a manner that at the end of each fiscal year the amount of capital, if any, so furnished by each Patron is clearly reflected and credited in an appropriate record to the capital account of each Patron. The Cooperative shall within a reasonable time after the close of the fiscal year notify each Patron of the amount of capital so credited to its capital account. All such amounts credited to the capital account of any patron shall have the same status as though they had been paid to the patron in cash in pursuance of a legal obligation to do so, and the patron had then furnished the Cooperative corresponding amounts for capital. Other than operating margins, funds and amounts received by the Cooperative that exceed the Cooperative's costs and expenses (also known as non-operating margins-interest) may be allocated as Capital Credits to Patrons in the same manner as the Cooperative allocates operating margins to Patrons, retained or used by the Cooperative as permanent, non-allocated capital, used to pay or offset any Cooperative cost or expense, or used as otherwise determined or approved by the Board.

The term "Capital Credits" means the amounts allocated to a Patron and contributed by the Patron to the Cooperative as capital. Consistent with these Bylaws, the allocation of Capital Credits is in the discretion of the Board and the Board must determine the manner, method, and timing of allocating Capital Credits. The Cooperative may use or invest unretired Capital Credits as determined by the Board. The Patron authorizes the Cooperative to perfect its security interest by filing a financing statement. Through a security agreement signed or authenticated by a Patron, the Patron may grant the Cooperative a security interest in Capital Credits allocated to the Patron and authorize the Cooperative to perfect the security interest. The Board shall have the power to adopt rules providing for the separate treatment of that portion (that is, power supply or other service or supply portion) of capital credited to the accounts of patrons which corresponds to capital credited to the account of the Cooperative by an organization furnishing electric service or any other service or supply to the Cooperative. Such rules shall;

1. Establish a method for determining the portions of such capital credited to each patron for each applicable fiscal year;

2. Provide for separate identification on the Cooperative's books of such portions of capital credited to the Cooperative's patrons;

3. Provide for appropriate notifications to patrons with respect to such portions of capital credited to their accounts; and,

4. Preclude a general retirement of such portions of capital credited to patrons for any fiscal year prior to the general retirement of other capital credited to patrons for the same year or of any capital credited to patrons for any prior fiscal year.

In the event of dissolution or liquidation of the Cooperative, after all outstanding indebtedness of the Cooperative shall have been paid, outstanding Capital Credits shall be retired without priority on a pro rata basis before any payments are made on account of property rights of Members. If, at any time prior to dissolution or liquidation, the Board shall determine that the financial condition of the Cooperative will not be impaired thereby, the capital then credited to patrons' accounts may be retired in full or in part.

After operations begin, the Board shall determine the method, basis, priority and order of retirement, if any, for all amounts furnished as capital. Capital credited to the account of each patron shall be assigned only on the books of the Cooperative pursuant to written instructions from the assignor and only to successors in interest or successors in occupancy in all or a part of such patron's premises served by the Cooperative unless the Board acting under policies of general application, shall determine otherwise. Notwithstanding any other provision of these Bylaws, the Board, at its discretion, shall have the power at any time upon the death of any patron, who was a natural person, if the legal representatives of his estate shall request in writing that the capital credited to any such patron be retired prior to the time such capital would otherwise be retired under the provisions of these Bylaws, to retire capital credited to any such patron immediately upon such terms and conditions as the Board, acting under policies of general application, and the legal representatives of such patron's estate shall agree upon; provided, however, that the financial condition of the Cooperative will not be impaired thereby. If no legal representative has been appointed for the estate, an heir of the deceased may make the request and agreement upon such terms and conditions as the Board may prescribe. The Cooperative, before retiring any capital credited to any patron's account, shall deduct therefrom any amount owing by such patron to the Cooperative, together with interest thereon at the Tennessee legal rate on judgments in effect when such amount became overdue, compounded annually.

Patrons or legal representatives of the estates of patrons may elect to contribute all or a part of the capital credits to the Cooperative or, if formed in the future, to the Community Services Cooperative Foundation of Jackson. Such election will be made in writing. The patrons of the Cooperative, by dealing with the Cooperative, acknowledge that the terms and provisions of the Charter and Bylaws shall constitute and be a contract between the Cooperative and each patron, and both the Cooperative and the patrons are bound by such contract, as fully as though each patron had individually signed a separate instrument containing such terms and provisions.

ARTICLE X
PAYMENT OF EXPENSES, ETC. IN SELLOUT DELIBERATIONS

In the event that an officer, Director, Member or group of Members shall incur any reasonable expenses, costs, and/or attorney’s fees in connection with any mailing publications, membership meeting, or litigation opposed to buying or selling the business or all or substantially all of the assets of the Cooperative, and provided such expenses, costs and/or fees have not been or are not to be reimbursed or paid by any other person, firm, association or corporation, such costs, expenses and fees shall be paid by the Cooperative provided they were incurred in opposition to

such proposal.

ARTICLE XI
WAIVER OF NOTICE

Any Member or Director may waive, in writing, any notice of meetings required to be given by these Bylaws. Personal attendance at any meeting of the Members or Directors shall constitute a waiver of notice of such meeting unless such personal attendance shall be for the express purpose of objecting to the transaction of any business on the ground that the meeting shall not have been lawfully called or convened. Any Member or Director attending any meeting for the purpose of making such objection shall notify the Secretary prior to or at the beginning of the meeting of his objections. Waiver of Director meetings is also subject to Section 6.3.

ARTICLE XII
DISPOSITION & PLEDGING OF PROPERTY; DISTRIBUTION OF SURPLUS ASSETS ON DISSOLUTION

Section 12.1. Transfer of Cooperative Assets. Except for any sale, lease, exchange, or other disposition ("Transfer") of any Cooperative property or Cooperative asset ("Asset"):

1. To secure indebtedness;

2. Pursuant to condemnation or threat of condemnation;

3. Pursuant to an existing legal obligation;

4. Associated with a consolidation or merger;

5. To another entity operating on a cooperative basis and providing electric energy; or,

6. To a Cooperative subsidiary, the Cooperative shall not transfer, during any twelve (12) month period, more than ten per centum (10%) of the Cooperative's assets unless:

   a. At the expense of the person seeking to purchase, lease or acquire the Cooperative's assets, the Board appoints three (3) independent appraisers, each of whom, within a reasonable time of appointment, evaluates and renders an appraisal valuing the Cooperative's assets specified in the proposed transfer ("Appraisal");

   b. Within a reasonable time of receiving the appraisals, the Cooperative invites any other entities operating on a cooperative basis, providing electric energy, and primarily located within the same state as, or within a state adjacent to, the state in which the Cooperative is primarily located to submit proposals to purchase, lease, or acquire the Cooperative's assets specified in the proposed transfer, or to merge or consolidate with the Cooperative;

   c. The Board approves the proposed transfer;

d. By mail ballot, at least three-fourths (3/4) of the total Membership approves the proposed transfer; and

e. Notice of any Member meeting at which Members will consider the proposed transfer states that one of the purposes of the Member meeting is to consider the transfer, and includes a copy or summary of the proposed transfer.

In proportion to the value or quantity of Cooperative services used by Members during the period in which the Cooperative owned a Cooperative asset, the Cooperative allocates and credits to Members as Capital Credits any consideration received for the Cooperative's assets that exceed the amount paid for the Cooperative assets. Unless otherwise determined by the Members, after the Members approve a transfer, the Board may abandon the transfer. To secure indebtedness, the Board may transfer, mortgage, pledge, dedicate to repayment, or encumber any Cooperative asset.

Section 12.2. Distribution of Surplus Assets on Dissolution. Upon the Cooperative's dissolution, any assets remaining after all liabilities or obligations of the Cooperative have been satisfied and discharged shall be distributed among all persons who shall have been Members of the Cooperative at any time during the fiscal year in which such dissolution is authorized by vote of the Members or any of the five (5) next preceding years, prorated to them on the basis that their respective patronage during all such years bears to the total receipts of the Cooperative for all such years. Provided, however, that if in the judgment of the Board the amount of such surplus is too small to justify the expense of making such distribution, the Board may, in lieu thereof, donate, or provide for the donation of, such surplus to one or more nonprofit charitable or educational organizations that are exempt from federal income taxation.

ARTICLE XIII
FISCAL YEAR

The Cooperative's fiscal year shall begin on the first day of the month of January of each year and end on the last day of the month of December following.

ARTICLE XIV
RULES OF ORDER

Parliamentary procedure at all meetings of the Members, of the Board, of any committee provided for in these Bylaws and of any other committee of the Members or Board which may from time to time be duly established shall be governed by the most recent edition of Robert's Rules of Order, except to the extent such procedure is otherwise determined by Law or by the Cooperative's Governing Documents, or by action of the Board.

ARTICLE XV
SEAL

The corporate seal, if one is established, of the Cooperative shall be in the form of a circle and shall have inscribed thereon the name of the Cooperative and the words "Corporate Seal, Tennessee."

ARTICLE XVI
LEGAL FORMALITIES

These Bylaws are governed by, and are to be interpreted under the laws of the State of Tennessee and any proceedings or actions arising therefrom shall be brought in a forum of competent jurisdiction located therein. The Board reserves the right to amend the Bylaws of the Cooperative at any time and for any reason consistent with the purpose of the Cooperative. Such amendment may be adopted without prior notice to Members, and such amendment shall become binding on the Members automatically on the effective date of the amendment. The titles and headings of the Charter and Sections of these Bylaws are for convenience and reference only, and do not affect the interpretation of any Bylaw, Article, Section, or sub-section thereof. The failure of the Cooperative to assert any right or remedy provided by these Bylaws does not waive the right or remedy provided by these Bylaws. These Bylaws and the Member Agreement constitute the entire agreement between the Cooperative and the Members and supersede any prior or contemporaneous oral or written communication or representation. The invalidity of any Bylaw provision does not invalidate the remaining Bylaw provisions. In the event a provision of these Bylaws is found to be invalid, the remaining provisions are to be read in such a manner as to give the fullest effect to the entire document as if, to the extent legally possible, the invalid provision were valid.

ARTICLE XVII
AMENDMENTS

Except as otherwise provided in these Bylaws, these Bylaws may be adopted, amended, or repealed only by two-thirds of Directors present and entitled to vote at a regular or special meeting of the Board. Except as otherwise provided in a Bylaw Amendment, the Amendment is effective the day after the vote approving the Amendment. The Cooperative must notify Members of amended Bylaws at the annual meeting following the amendment.

Notice of a Board meeting at which Directors will consider a proposed Bylaw amendment must: (1) state that the purpose or one of the purposes, of the Board meeting is to consider the proposed Bylaw amendment; and (2) contain, or be accompanied by, a copy or summary of the proposed Bylaw amendment. After notice of a proposed Bylaw amendment, the proposed Bylaw amendment may not be materially changed before the meeting at which the amendment will be considered.

_____

_____, Secretary

COMMUNITY DEVELOPMENT ENTERPRISES

The New Roosevelt Parkway Solar Microgrid

We're building a **$55,000,000 Community-Solar Microgrid** on Roosevelt Pkwy. just west of Dr. F. E. Wright Dr. It will supply **clean, renewable, reliable energy** to **businesses like yours.** It will begin operations between September and December, 2021.

What is this solar microgrid? 51,500 solar panels with huge batteries, wired underground directly to new, smart meters in your buildings. A smart microgrid controller allocates the energy as needed. It will supply a large portion of the energy you use, and you'll continue to use JEA for the rest."

The economic impacts to Jackson and the publicity of a system of this scale are expected to be dramatic and far-reaching. Our team believes Jackson will tell an inspiring story of what forward-thinking American ingenuity and a culture embracing Clean Energy can do to change this nation's rust belt into a green belt.

Benefits to customers

1. **Your electricity costs** will be reduced, **at no cost to you**
2. **Future pricing** is stable and predictable, versus 40%-125% increase over next 5½ years
3. **Go green with solar; be technology leaders; meet your company's environmental goals**
4. **Resiliency: no loss of power** when TVA's grid suffers brownouts or failures. Storm-proof.
5. **Higher-quality power**, more usable power out of the energy you buy, preserves machinery
6. Monitor your electric use **by circuit** within each building to maximize efficiency.

Advantages over acquiring your own solar

1. Overcomes **TVA's economic barriers** to acquiring solar
2. Economies of **scale**
3. Optimal siting for the solar panels, without use of your rooftops or land
4. Dynamic control over your energy sources, with autonomous, automatic self-healing
5. No operating or maintenance hassles or expenses
6. No need to pay for upgrades to latest technologies. We do that without charge to users.

Benefits to Jackson

1. Making solar economical for businesses
2. Economic impact to Madison County of $212M over 10 years
3. Lets businesses know Jackson is going green & is a forward-looking, innovative community
4. Local hiring by solar developer & local contractors
5. 511 new FTE local jobs in 2021
6. Training at local colleges for solar careers, from solar developer and us
7. Courses in local schools about renewable energy and batteries
8. Reducing stress on utilities' transmission and distribution systems

Community Development Enterprises
1104 Whitehall St., Jackson, TN 38301
Email: de@ComDevEnt.com
Phone: (731) 240-5001

COMMUNITY DEVELOPMENT ENTERPRISES

Request for a Proposal

Please use the electrical information we gave you to design a proposal specifically for us, telling us

- What electricity you can supply to us from your Roosevelt Parkway Solar Microgrid
- What uninterruptible power you can supply us during JEA grid brownouts and blackouts
- The quality of power we would receive from you
- The equipment you would install at our site, without charge to us
- Our new capability to monitor our usage in detail, by circuit
- Our monthly costs for the electricity we use from the Microgrid
- An estimate of our annual savings in total electricity costs
- The terms and conditions of a Power Purchase Agreement to be signed

Why we need electricity from the Roosevelt Parkway Solar Microgrid (check all that apply):

___ To lower our electricity costs
___ To have stable, predictable, future electric pricing
___ To switch as much as possible to clean, green, renewable energy
___ To meet our company's goals for reducing greenhouse gas emissions
___ To have reliable, uninterruptible power during grid brownouts and blackouts
___ To extend the life of our machinery through higher-quality, steady power
___ To monitor our electricity use by circuit so we can improve efficiency
___ Acquiring our own solar and batteries is too expensive or capital-intensive
___ We don't have room on our roof or site for our own solar and batteries
___ We can't spare the resources to operate, manage, and maintain our own solar
___ We wouldn't be able to afford to keep our own solar upgraded to the latest technologies

Here is the information you need about us to design this proposal

- The best person for you to contact at our business is _____
- You may mention our company's name as interested in solar: Yes / No
- Our company's credit rating (Moody's, S&P, or Fitch) is _____
- Either
  - ☐ Here are our last 12 months of JEA bills, or
  - ☐ Here are our username & password to JEA's website for you to download our bills:

    _____
- **We will call JEA at (888) 577-6427 soon and ask them to send us soft and hard copies of our hourly usage data for the past 12 months. When we receive it, we'll forward it to CDE.**
- What accounts for our demand peaks is _____

We understand that Community Development Enterprises (CDE) will keep the information we give them strictly confidential, sharing it only with its microgrid development company, Northern Reliability, Inc., who also promises to keep it confidential.

Signed _____
Printed Name _____
For (company name) _____

Community Development Enterprises
1104 Whitehall St., Jackson, TN 38301
Email: de@ComDevEnt.com
Phone: (731) 240-5001

Community Development Enterprises
1104 Whitehall St., Jackson, TN 38301
Email: de@ComDevEnt.com
Phone: (731) 240-5001

COMMUNITY DEVELOPMENT ENTERPRISES

Request for Proposals

To Finance a Solar Microgrid in Jackson, Tennessee

Proposal Due Date	February 15, 2021, at 5:00 p.m. Central Daylight Time
Send Proposals To	Community Development Enterprises DE@ComDevEnt.com (731) 240-5001
For Questions, Contact	Dennis Emberling, Chief Executive Officer

1. Introduction to the Project and its Principals

1.1. Project Summary. Community Development Enterprises - Jackson I (CDE), a Tennessee Joint Venture general partnership, is working on opening up the market for access to solar, solar plus storage, and microgrid networks in the many U. S. areas where these technologies are presently unobtainable. In the process, we will be helping many economically-distressed communities go green, redevelop economically, and improve quality of life for their citizens. Our first such community is Jackson, Tennessee, where we will build our first five Solar Microgrids.

In a Solar Microgrid, solar panels generate the electricity, which is stored in batteries and sent directly to our customers via direct wiring, not the utility's wires. Customers remain connected to the utility grid as they are now, but only draw part of their electricity from the utility. Much of their electricity, and most of their peak demand, will be supplied by our Solar Microgrid.

In addition to lowering their electricity costs and switching them to solar, the Solar Microgrid will provide its customers with high-quality, reliable, continuous power at all times, even during cloudy days and some night use. It continues uninterrupted when the main utility grid goes down by working with the microgrid controllers and dedicating power to critical applications and load centers within customer facilities.

The Solar Microgrid will have a 23.2 Megawatt, utility-scale, solar facility on our 33.7 acre site in Jackson, with approximately 46MWh of battery-energy storage, smart electrical panels at our customers' buildings, and sophisticated microgrid controller hardware and software to optimize the entire system.

The project will cost about $55M. Its tax benefits (Investment Tax Credit, New Market Tax Credit, and Accelerated MACRS Depreciation) have a total present-value to tax-equity investors of between 79% and 97% of the capital cost of the project, depending on their federal and state income

tax rates. This, plus potential grants, likely TIF funding, $5M per year revenue from our customers, and minimal operational expenses make the project very feasible economically.

The economic impacts to Jackson and the publicity of a system of this scale will be dramatic and far-reaching. An expert, comprehensive study of the economic impact of our Solar Microgrid on Madison County (primarily Jackson) is $212M over 10 years plus another $14M in new tax receipts. Most importantly, it includes 511 new full-time-equivalent jobs for 2021.

This study analyzed all contributors to Jackson's and Madison County's gross regional product, not the value of goods and services imported from outside the county. It used IMPLAN, the nationally-recognized leading standard for economic impact analysis, with data sets from the U. S. Bureau of Labor Statistics, Bureau of Economic Analysis, Census Bureau, and Department of Agriculture. It calculates impacts on 528 different business sectors. It includes direct, indirect, and induced effects.

We believe Jackson will tell an inspiring story of what forward-thinking American ingenuity and a culture embracing Clean Energy can do to change this nation's rust belt into a green belt.

1.2. Principals and Companies Executing the Project

. CDE is managed by Dennis Emberling, CEO. His forty-year career as an internationally-known management consultant has included engagements with companies from small to Fortune 100. His innovations in management science and organizational development are in use all over the world, including the United Nations Development Program. He is also an authority on distributed solar, having consulted for solar companies in California for seven years. He is a member of the California Intergovernmental Task Force on Consumer Protection and regularly advises the California Public Utility Commission. He was trained as a mathematician, and he has decades of experience in all aspects of business finance.

CDE's CFO is David Shimon, a founder and former owner of a commercial bank in Maryland, serving on its loan committee and board of directors. He also founded a $60 M technical company and served as its board chairman. He has had many years of experience in guiding young companies to success. In recent years, he has owned and operated a Florida solar company. David is very active in and a regular speaker for many community groups that feed the elderly and provide services in under-developed empowerment zones in Florida.

The COO of CDE is Michael D. Miner of Jackson, Tennessee. He served 24 years in the US Army and retired as a Lieutenant Colonel. He is a disabled veteran. He is an expert on quantitative analysis, statistics, decision making, and strategic planning. He recently retired from the U. S. Customs and Border Protection Agency as Director of Enterprise Reporting and Data Systems. Michael holds a Master of Arts in Applied Mathematics from the University of Maryland and Master of Science in Business Administration from Boston University. His undergraduate degree (general engineering with concentration in Mathematics and Economics) was obtained from the United States Military Academy, West Point, NY. He also serves as an Assistant Professor of Mathematics for American Military University/American Public University. He established and operates a real estate development company in Jackson, Tennessee that builds quality, affordable, energy efficient, and accessible homes for aging adults and Americans with disabilities.

Our VP of Planning is John C. Meyer, Jr., senior partner of a small consulting business engaged in strategic planning, business management, and business case analysis for commercial and government clients. Last year, his firm contracted to redesign the Air Force's largest command, the

Air Combat Command. The previous year, he conducted an economic impact analysis that resulted in governmental approval for over $560M of residential construction projects. He was chairman of the Gloucester County, Virginia Board of Supervisors, so is able to contribute knowledge and insight into the operations of local governments. John is a combat veteran and former Air Force Colonel.

Our VP of Logistics is Nissim Levy, Ret. Brigadier General, Israel Police. Nissim graduated from Haifa University with a Bachelor's Degree in Political Science, and Master's Degree in National Security from Haifa University and Israel National Defense College (INDC) in collaboration with Israel Defense Forces (IDF). He has an extensive background in management and logistics. Nissim dealt with development of various projects, research and development, and logistics operations.

Our developer and owner's engineer is Northern Reliability, Inc. (NRI), of Waterbury, Vermont. Over the past forty years, NRI has designed and deployed over one thousand energy-storage and hybrid-power microgrid systems worldwide for the U.S. government, military, commercial, and industrial clients. As the oldest operating engineering firm in the energy storage and hybrid power systems space in the world, NRI brings a wealth of knowledge and experience to the team.

Our civil engineering firm is L. I. Smith & Associates, LLC, of Paris, Tennessee.

1.3. Request for Proposals. CDE is seeking a financial institution (FI) partner to participate in the Solar Microgrid project in Jackson, Tennessee that it is developing and will own and operate. We are requesting proposals from FIs for the following:

- Permanent, 30-year financing for as much of the $55,000,000 capital budget as possible, preferably financed by tax-equity investment
- Financing for the balance of the capital budget not financed by the permanent financing
- Interim project-development and construction-phase financing

The proposer is asked to discuss all financial variables in its response to this RFP. The proposer may also choose to submit multiple options to reconcile trade-offs in its response to the RFP. Selection of the FI will be a selection for negotiation. That is, CDE and the FI will further refine the elements of the proposal to arrive at final agreements. The RFP process will identify the FIs that can offer lowest rates, longest tenors, broadest access to finance, and sufficient assets to meet CDE's lending needs.

2. Background on Solar Microgrids

2.1. What is a Microgrid. A microgrid is a discrete energy-system consisting of distributed loads and energy sources, with demand management, storage, and generation, capable of operating in parallel with or independently from the utility grid. Microgrids perform dynamic control over energy sources, enabling autonomous and automatic self-healing operations. By putting the energy generation facility close to the energy users, microgrids reduce transmission losses by up to 15%, increase efficiency and lower cost. They also improve power quality (which lengthens the life of electrical machinery), power factor (more real usable power), and voltage stability.

2.2. Need for Solar Microgrids. There are only three available sources of clean, renewable electricity for businesses, colleges, and public facilities: utilities with renewable generators, individually-hosted solar, or a Solar Microgrid. Otherwise, they're stuck with expensive, dirty, unreliable, low-quality electricity whose prices are bound to rise.

But utilities continue to be slow to shift to renewables. Most utilities still get 83% of their electricity from fossil-fuels and nuclear generation.[1] Utilities are also suffering more frequent and longer brownouts and blackouts due to disasters, severe weather, and wildfires. Loss of power is a danger to first responders, medical facilities, and storm shelters during emergencies. It is costly to manufacturers because it interrupts production. It is devastating to data centers. All such users need uninterruptible backup power from individually-owned generators or shared generators. Individually-hosted solar is unavailable to 48% of U. S. non-residential facilities,[2] particularly low- and moderate-income communities. Residences and business unable to afford solar typically also lack the additional resources to pair solar with effective energy storage, thus leaving their power supply reliant purely on Mother Nature.

Obstacles to Individually-Hosted Solar

- Lack of suitable land or roof space
- Sub-optimal weather
- Technical problems of acquisition
- Must operate and maintain a facility
- Loss of freedom to relocate
- Cost of individually-hosted solar
- Lack of state incentives
- Lack of attractive financing
- Lack of cost-effective Net Metering
- Unfavorable utility rate-schedules

2.3. Benefits of Solar Microgrids. Full-Time, Commercial, Solar Microgrids serve clean, uninterruptible energy to multiple, grid-connected, commercial users. They provide all the benefits of individually-owned solar, plus overcome all the barriers to individually-hosted solar, especially in economically-distressed communities. Communities also benefit from their Solar Microgrids. A clean, green city with low cost for uninterruptible electricity attracts new businesses and encourages existing ones to expand. This brings new jobs and economic development. Having Clean-Energy technologies within a community presents opportunities both to educate K-12 school children on the benefits of green energy and to train workers to participate in the sector.

Benefits of Full-Time, Solar Microgrids for Commercial Users

- Lower electricity prices
- Stable future pricing
- No upfront costs
- High quality power=longer machine life
- Lower cost through economies of scale
- Shared, smart storage greatly reduces cost
- Off-site location that's ideal for solar
- Monitor usage by circuit; improve efficiency

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[1] *More Claims of Greenwashing at Major US Electric Utilities*, pv-magazine-usa.com/2019/11/18/more-claims-of-greenwashing-at-major-us-electric-utilities

[2] *Shared Solar: Current Landscape, Market Potential, and the Impact of Federal Securities Regulation*, David Feldman, NREL, nrel.gov/docs/fy15osti/63892.pdf

- Uninterruptible power when grid fails
- Increased safety for critical facilities
- Utility grid for supplementary power
- Enhance green reputation & incentives
- Meet corporate environmental goals
- No recurring upgrade costs
- No operations or maintenance costs
- Dynamic control and automatic self-healing
- Retain freedom to relocate
- Energy from generator; no middlemen

2.4. Challenges for Solar Microgrids. Despite these benefits, only a little over 2 gigawatts of Solar Microgrids have been installed in the U. S.[3] and only 181 megawatts in Tennessee, as of early 2020. Here's why[4]:

Obstacles to Developers of Solar Microgrids

- Hostile utilities
- Net metering weak or unavailable
- Regulatory obstacles
- Misunderstood governmental policies
- Marketing costs to acquire customers
- Distribution costs and easements
- Managing supply and demand
- Billing complexities and costs
- Scarcity of creative financing solutions
- Challenges to allocating tax-credit benefits
- Possible SEC regulation if shared ownership
- Challenges of building partnerships
- Lack of legal precedents
- Lack of data on project successes

2.5. A Way to Overcome the Obstacles to Solar Microgrids. Avoiding local-utility interconnection solves many problems: no costs, delays, oversight, regulation, or restrictions from the local utility or federal regulators, because not connected to the federal grid system. This requires that the Solar Microgrid be wired directly to its customers. To be economical, this necessitates a small number of customers located close to the solar facility, along with easements for the wiring trenches. Substantial storage, such as batteries, is required to shave the peaks off the users' demand, thereby greatly lowering their utility bills. A Solar Microgrid with a sophisticated Microgrid Controller is needed to monitor and modulate supply and demand for electricity.

This kind of Solar Microgrid can be profitable in an economically-distressed community, which makes New Market Tax Credits available, on top of the Investment Tax Credit and accelerated depreciation. Peak-demand charges for heavy electricity users in Jackson typically account for 44% to 66% of their bills. The Solar Microgrid can fulfill nearly all their peak-demand needs and charge them a bit less than the utility for this service. That way, they reduce their electricity costs while remaining connected to the utility for the rest of their electricity.

Since our customers will be only a few heavy users of electricity, like manufacturers and other commercial users, acquiring customers is quick, easy, and inexpensive. Power Purchase Agreements

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[3] *Community Solar*, seia.org/initiatives/community-solar

[4] *National Community Solar Partnership Fact Sheet*, U. S. Department of Energy, Office of Energy Efficiency & Renewable Energy, energy.gov/eere/solar/downloads/fact-sheet-national-community-solar-partnership

(PPAs) and smart meters make billing these few customers manageable. Tax benefits make tax-equity funding very attractive to investors. Thirty-year PPAs make income streams dependable for customers, with many replacement customers available if needed.

This model for Solar Microgrids is a variant of NREL's Special Purpose Entity (SPE) model for solar facilities. As in the SPE model, a business entity, Community Development Enterprises will own or lease the microgrid's land, as well as operate and maintain it. The way our model differs from NREL's SPE model is that, instead of distributing the solar energy produced via a utility's grid, we will wire our commercial customers underground directly from the solar facility.

2.6. Solar Microgrids Today. Most Solar Microgrids are owned either by their users or a solar developer. They distribute their energy across the local utility's grid and are interconnected to it to sell excess power back to the utility. These are found in areas where utility policies and state regulations make them economically feasible. Those others that are wired directly to users are found mostly on military bases, medical centers, university campuses, and multi-building company sites.

2.7. The Future of Solar Microgrids. NREL reports that "If federal, state, and local policies can institute a supportive regulatory environment, shared solar presents an area of tremendous potential growth for solar photovoltaics (PV), expanding the potential customer base to 100% of homes and businesses. By opening the market to these customers, shared solar could represent 32%–49% of the distributed PV market in 2020, thereby leading to growing cumulative PV deployment growth in 2015–2020 of 5.5–11.0 GW, and representing $8.2–$16.3 billion of cumulative investment. There are several factors that may cause shared solar deployment to be significantly higher than these estimates, including less-restrictive participation, better value proposition through economies of scale, and ability to service a much higher share of customer load."[5]

MicrogridKnowledge.com also reports that "Microgrid developers are moving away from fossil fuels. Instead, they're installing solar and energy storage."[6]

Solar Microgrids for a small number of nearby, grid-connected commercial customers is a way to make solar available to large parts of the country that presently cannot obtain it. Economically-distressed communities in these areas can achieve economic development and environmental health otherwise difficult to attain.

The National Community Solar Partnership within the U. S. Department of Energy's Office of Energy Efficiency & Renewable Energy has recognized our project's potential to open up areas of the country to solar energy and economic development by awarding us a technical-assistance grant.

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[5] *Shared Solar: Current Landscape, Market Potential, and the Impact of Federal Securities Regulation*, David Feldman, NREL, nrel.gov/docs/fy15osti/63892.pdf

[6] A *Surprise to Analysts: Less CHP in Microgrids, More Solar*, Lisa Cohn, Microgrid Knowledge, microgridknowledge.com/chp-microgrids-icf-database/

3. Description of Our Project

3.1. Location. We chose Jackson, Tennessee as the location for our first five Solar Microgrid projects. It is a small, economically-distressed city of about 67,000 in southwest Tennessee. Our partners include prominent native Jacksonians who want to help the city redevelop. They own land in Jackson and are leasing it to the joint venture with an option to purchase, which we will do soon.

A Community Redevelopment Agency (CRA) was established in 2009 and works with private entities and developers to form public-private partnerships to "help Jackson recover fully from its devastating losses, as well as bring its neighborhoods to a stable level of health and safety" (ibid). Our group has a long working relationship with CDA. Our development project is strongly supported by the Jackson municipal government, community groups, and colleges in the district.

Jackson gets its electricity from its own municipally-owned utility, Jackson Energy Authority (JEA), which in turn buys power from the Tennessee Valley Authority (TVA). TVA's service area covers all of Tennessee and parts of seven neighboring states. It has no Net Metering program, so solar owners cannot sell excess energy back to its grid. Since the end of 2019, it has had no solar-incentive program, so it is uneconomical to build a solar farm to sell electricity to TVA. The state of Tennessee also has no solar-incentive programs. Combined with less-than-ideal weather for solar, these factors have kept most solar out of TVA's service area, both individually-hosted and farms.

Our first site is a 33.7 acre vacant parcel on Roosevelt Parkway, just west of Dr. F. E. Wright Dr. It has perfect, unshaded, south-facing exposure to the sun and easy access from two points on Roosevelt Parkway. It is not in a flood zone. It is subject to high winds, but our facility will be hardened against all winds up to 240 mph, and all our wiring will be underground. We have already received four of the six environmental approvals required. The other two are quick and very unlikely to be a problem: vegetation impact and hydrology. The property will be zoned "utility." There is one row of houses to the south and a small housing development to the west. It adjoins vacant land to the north and east. It is ideal for solar.

3.2. Off-Takers/End-User Customers. Our site is conveniently located near at least 38 suitable heavy users of electricity. These include a Kellogg facility that makes Pringles chips, a Pinnacle Foods Group facility that makes Quaker Oats products, TBDN (Toyota), The Carlstar Group, UGN, Equistar/Lyondell Basell Industries, and J&J Cupples Co. We are presently in discussions with potential customers, and they have indicated serious interest in receiving our electricity. We anticipate that they will want more electricity than we can provide, so there will be far more than enough customers to buy all the energy we can produce.

3.3. Future Expansion. The 33.7 acre site cannot produce enough solar energy to meet most of the needs of all these customers, so we are offering it to just enough of them to use up all the energy we can generate. However, we have a good possibility of acquiring a 51.5 acre site just north of that. If we decide to expand later, there is ample land and plenty of nearby customers to serve.

Possibilities for later expansion include Lane College, a famous, historic black college, only .7 miles to the southeast, and Jackson State Community College (JSCC) only .7 miles to the north.

3.4. Our Solar Facility. We will use panels with a high ratio of energy production to rated power output, therefore low cost of actual energy produced, excellent performance at low irradiance (important in Tennessee weather), efficiency, reliability, minimal degradation, longevity, and meaningful warranty with a history of honoring it with good support. This combination of advantages will give us the maximum energy our site can support at the lowest cost per kWh. It will minimize our costs for repairs and replacements. It will ensure the longest life of our system with minimal degradation. And when anything goes wrong, it ensures the manufacturer will repair or replace components without cost to us. Our panels will have the additional advantage, especially important in Jackson, of resistance to wind loads between 67% and 275% higher than ordinary panels, with a rating of 9,000 pa that equates to a wind resistance of 240 mph. (The strongest one-minute sustained wind on record in the U.S. was 215 mph.)

Our solar facility will include approximately 51,485 panels of 450 watts each at 22.2% efficiency. The total will be 23.168 MW STC DC output power. We will employ central solar inverters and solar-plus-storage inverters for highest efficiency and reliability. Our panels will be on fixed mounts, without trackers. They will produce approximately 36,122 MWh AC per year (36 GWh/yr.).

We will also use approximately 46 MWh of lithium battery storage to shave off the peaks from our customers' demand profiles, provide power during cloudy periods, and some power at night. They will be housed in storm-hardened shelters with HVAC and fire-prevention.

3.5. Our Microgrid. Power will be distributed to our customers by our own, direct, trenched wiring from our solar facility. This is necessary because JEA/TVA does not allow any other use of its grid wiring. Each customer will be connected to our wiring with electrical equipment that sends them as much electricity from our solar and batteries as is available at that moment, and, if that isn't sufficient, sends them the rest of the electricity they need from JEA/TVA's grid. All the while, our microgrid is completely isolated from and independent of the JEA/TVA grid.

Power generated by our solar panels and stored in our batteries is tightly regulated for ideal frequency and voltage by our own electrical components on our site. The entire microgrid is monitored and controlled by sophisticated hardware and software equipment called a Microgrid Controller. It continuously monitors the production of the solar panels, the batteries' state of charge, and the demands from the users. It sends power from the solar to either the batteries or to the users, and sometimes power from the batteries to the users, in a way that optimizes the system for all its parts and our customers.

We are being granted easements from the City of Jackson along its streets and from the Norfolk Southern Railway along its tracks, so that we need few if any easements from private property along the way to our customers' sites.

3.6. Utilities and Regulators. Nearly all renewable-energy projects face substantial hurdles, costs, and delays from utilities and local, state, and federal regulators. Because our Solar Microgrid is not interconnected to the local utility's grid, we avoid all these hurdles, costs, and delays. Keyes and Fox, LLP, a San Francisco law firm specializing in distributed-generation and renewable-energy law, thoroughly researched all regulatory and utility restrictions that might be applicable to us. The result is that we believe that the only regulator who may require anything of us is the Tennessee

Public Utilities Commission, and that is just a certificate of need and annual reporting. Our attorney is in discussions with their counsel, and believes it will be easy to obtain.

3.7. Schedule. Our project should be completed and operational by the end of 2021 at the latest, with September being the earliest.

4. Budgets

4.1. Capital Budget

Design and pre-development	$2,000,000
Site preparation	414,000
Solar panels, inverters, all associated solar equipment, fully installed	30,118,000
46 MWh batteries, microgrid controller, engineering, commissioning	22,359,000
10 each 400-amp Genius main electrical panels, installed	57,000
Trenched wiring to end-user's sites	1,021,000
General contractor: electrical, concrete bases, fencing, security	350,000
TOTAL CAPITAL BUDGET	**$56,320,000**

4.2. Tax Benefits Available to Lenders. The tax benefits available to suitable sources of funding include the Investment Tax Credit (ITC) of 26%, New Market Tax Credits (NMTC) of 39% on the entire capital budget taken over 7 years (present value 30.825% at 6% nominal discount rate), and accelerated depreciation (first year and 5-year MACRS) whose present value depends on the lender's federal and state income tax rates. This present value (using 6% nominal discount rate) of tax savings on depreciation to corporate lenders paying Tennessee state income tax is 22.2%. It could be as high as 24.0% for California corporations. For pass-through entities exempt from state income taxes, it is 29.8%. If they are subject to Tennessee franchise and excise taxes, it is 35.0%; if California income tax, 40.5%. Thus the present value of the tax savings on accelerated depreciation is between 23.0% and 42.1%, making the present value of the combined tax benefits total 79.0% to 97.3%.

4.3. Revenues. We are confident we can sell all the electricity we can generate to a subset of the commercial users nearby, as described above. They will sign twenty-year Power Purchase Agreements with us (renewable for another ten years) to provide them with much of their electricity, plus uninterruptible power when the JEA/TVA grid fails. We calculate that we can eliminate their peak-demand charges (about 44% to 66% of their present utility bills) and charge a bit less than they presently pay for this service. They will remain connected to JEA for the rest of their electricity needs. We will adjust rates each year to keep up with inflation.

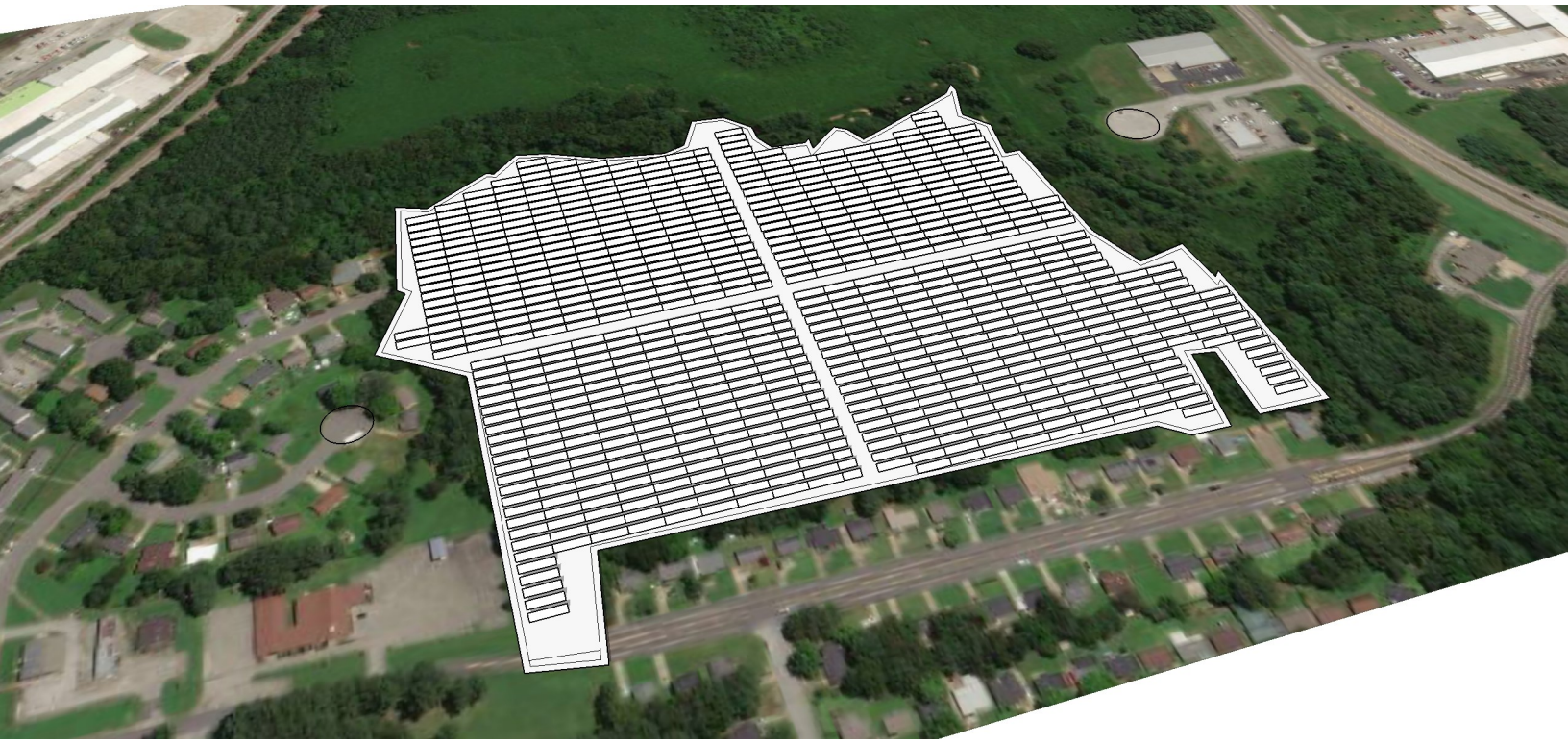
The current peak demand charges for the six largest of these nearby customers is approximately $7M per year out of $13.1M per year in actual electricity bills. The current peak demand charges for the other thirty manufacturers and other nearby commercial facilities is conservatively estimated at

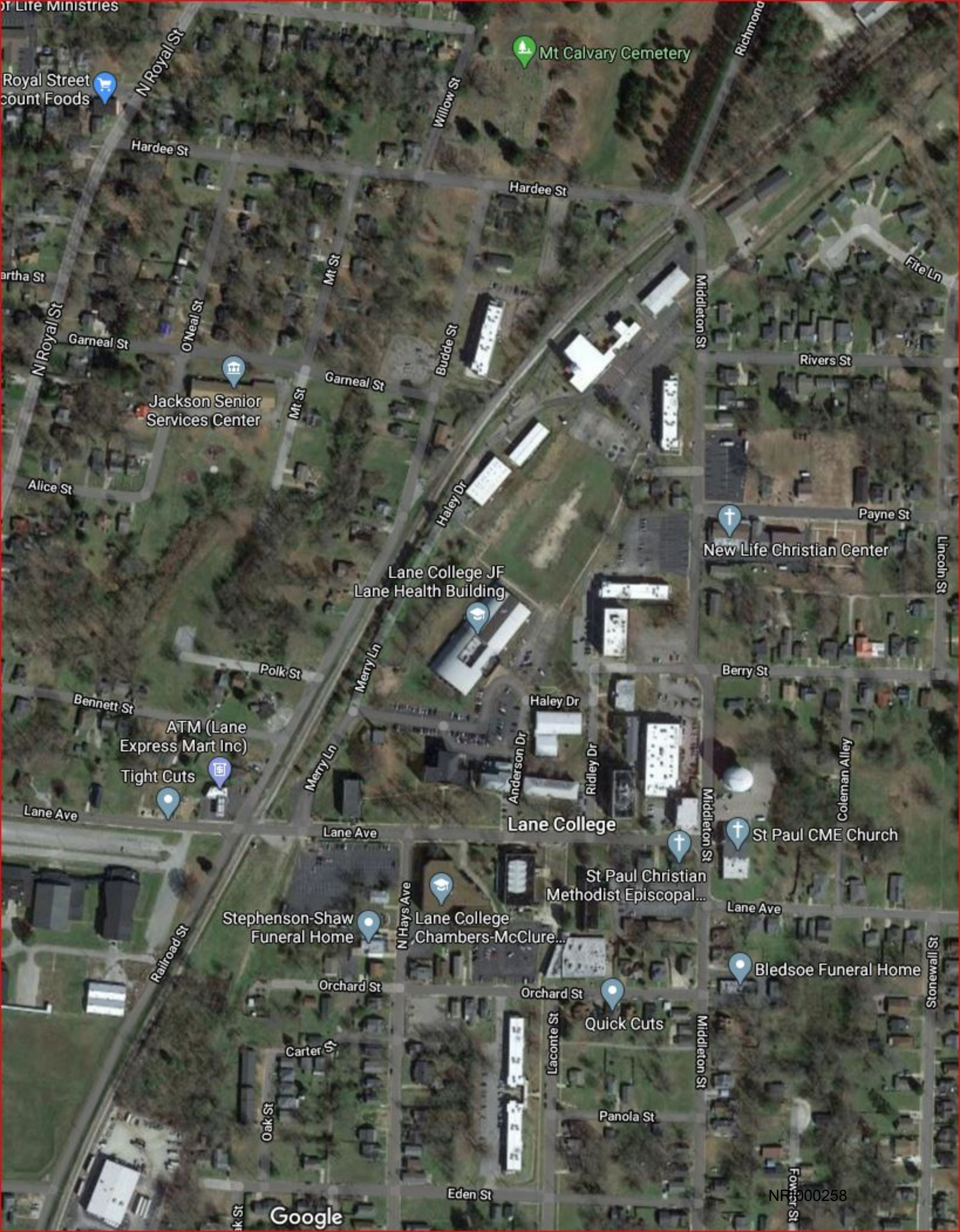
approximately $5M per year, for a total available pool of $12M in peak demand charges. We estimate we can provide approximately half this amount of demand, saving this subgroup of customers about $6M per year. Our charges to them for this electricity will therefore be at least $5M per year. This figure will be refined when our microgrid developer has all the details of our customers' electrical usage patterns and designs the Solar Microgrid to suit.

4.4. Expenses. Operating expenses will consist of property taxes at $167,000 per year, an O&M (Operations and Maintenance) contract for approximately $75,000 per year, insurance at approximately $75,000 per year (already estimated by the Global Energy Practice at our insurance company, Brown and Brown's Beecher Carlson Insurance Services, LLC), and other expenses for administration, billing, bookkeeping, accounting, and legal at approximately $80,000 per year. No expense for interest is included. These total approximately $397,000 per year.

4.5. Profits and Cash Flow. This estimated revenue and expenses leaves a profit of approximately $4.6M per year. Given the attractive tax benefits, annual loan payments are expected to be much less than this amount, leaving a substantial margin for cash flow.

4.6. Asset Valuation. If the asset is valued (as is usual with solar projects) on the basis of its net profits over the 30 year term of the PPAs, its present value would be approximately $116M at a 4% discount rate (including 3% inflation), $101M at a 5% discount rate, or $88M at a 6% discount rate, considerably in excess of the capital cost of the project.




Mt Calvary Cemetery
Royal Street
count Foods
N Royal St
Willow St
Hardee St
Hardee St
Mt St
Fite Ln
Middleton St
Rivers St
Garneal St
O'Neal St
Budde St
Garneal St
Jackson Senior
Services Center
Mt St
Alice St
Haley Dr
Payne St
New Life Christian Center
Lincoln St
Lane College JF
Lane Health Building
Merry Ln
Polk St
Berry St
Bennett St
Haley Dr
ATM (Lane
Express Mart Inc)
Tight Cuts
Merry Ln
Anderson Dr
Ridley Dr
Coleman Alley
Middleton St
Lane Ave
Lane College
Lane Ave
St Paul CME Church
St Paul Christian
Methodist Episcopal...
Lane Ave
N Hays Ave
Stephenson-Shaw
Funeral Home
Lane College
Chambers-McClure...
Railroad St
Bledsoe Funeral Home
Stonewall St
Orchard St
Orchard St
Quick Cuts
Laconte St
Middleton St
Carter St
Oak St
Panola St
Eden St
Google
NRHP000258


LANE COLLEGE CAMPUS MAP
WITH NUMBERED BUILDINGS
Mt Calvary Cemetery
N Royal St
Willow St
Hardee St
Garneal St
O'Neal St
Mt St
Budde St
Middleton St
Rivers St
Jackson Senior Services Center
Alice St
Haley Dr
Payne St
New Life Christian Center
Lane College JF Lane Health Building
Polk St
Merry Ln
Berry St
Bennett St
ATM (Lane Express Mart Inc)
Tight Cuts
C store around here
Lane Ave
Anderson Dr
Ridley Dr
Lane College
Coleman Alley
St Paul CME Church
St Paul Christian Methodist Episcopal...
Stephenson-Shaw Funeral Home
N Hays Ave
Lane College Chambers-McClure...
Railroad St
Orchard St
Quick Cuts
Bledsoe Funeral Home
Carter St
Laconte St
Oak St
Panola St
Eden St
Fowler
MIDDLETON

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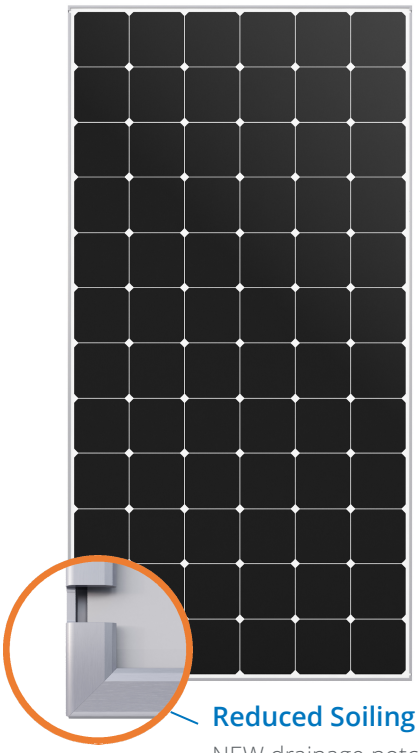
A SERIES

SUNPOWER®



Reduced Soiling
NEW drainage notch improves performance

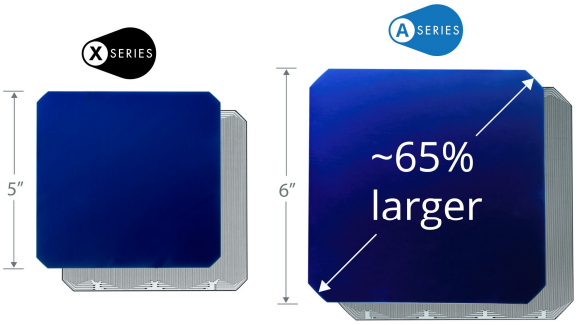
430–450 W Commercial A-Series Panels

SunPower® Maxeon® Technology

SunPower® Maxeon® cell-based panels maximize energy production and savings by combining industry-leading power, efficiency, and durability with the best power, product, and service warranty in the industry.[1,2]

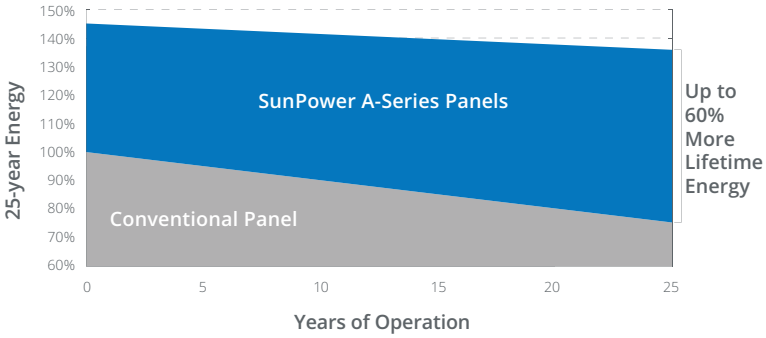
Highest Power Density Available

SunPower's new Maxeon® Gen 5 cell is 65% larger than prior generations, delivering the most powerful cell and highest efficiency panel in commercial solar. The result is more power per square meter than any commercially available solar.[1]



Maximum Lifetime Energy and Savings

Designed to deliver up to 60% more energy from the same space over the first 25 years in real-world conditions like partial shade and high temperatures.[1]

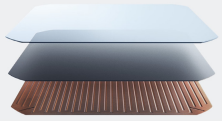


Best Reliability, Best Warranty

SunPower technology is proven to last and we stand behind our panels with the industry's best 25-year Combined Power, Product and Service Warranty.

BETTER PRODUCT · BETTER WARRANTY
25-yr SunPower Complete Confidence

SUNPOWER MAXEON SOLAR CELL TECHNOLOGY



Fundamentally Different. And Better.

- Most efficient cell in commercial solar[2]
- Delivers unmatched reliability[3]
- Patented solid metal foundation prevents breakage and corrosion

As sustainable as the energy it produces.

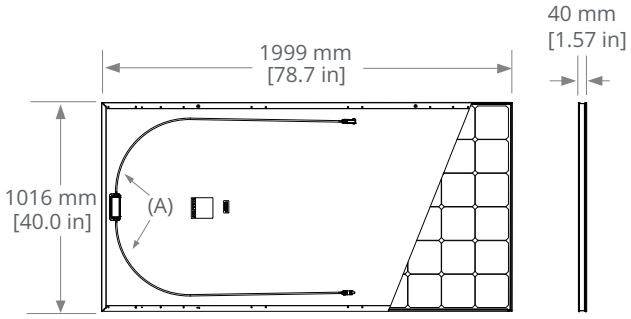
- Achieved the #1 ranking on the Silicon Valley Toxics Coalition's Solar Scorecard for 3 years running
- SunPower modules can contribute to your business's LEED certification[4]

430–450 W Commercial A-Series Panels – Preliminary datasheet

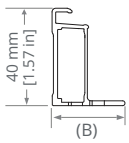
Electrical Data				
	SPR-A450-COM	SPR-A440-COM	SPR-A435-COM	SPR-A430-COM
Nominal Power (Pnom)[5]	450 W	440 W	435 W	430 W
Power Tolerance	+5/0%	+5/0%	+5/0%	+5/0%
Panel Efficiency	22.2%	21.7%	21.4%	21.2%
Rated Voltage (Vmpp)	44.0 V	43.4 V	43.0 V	42.7 V
Rated Current (Impp)	10.2 A	10.2 A	10.1 A	10.1 A
Open-Circuit Voltage (Voc)	51.9 V	51.6 V	51.4 V	51.2 V
Short-Circuit Current (Isc)	11.0 A	10.9 A	10.9 A	10.9 A
Max. System Voltage	1500 V UL			
Maximum Series Fuse	20 A			
Power Temp Coef.	−0.29% / ° C			
Voltage Temp Coef.	−136 mV / ° C			
Current Temp Coef.	5.7 mA / ° C			

Tests And Certifications - Pending	
Standard Tests	UL1703
Quality Management Certs	ISO 9001:2015, ISO 14001:2015
EHS Compliance	RoHS, OHSAS 18001:2007, lead free, Recycle Scheme, REACH SVHC-163
Ammonia Test	IEC 62716
Desert Test	10.1109/PVSC.2013.6744437
Salt Spray Test	IEC 61701 (maximum severity)
PID Test	1500 V: IEC 62804
Available Listings	UL

Operating Condition And Mechanical Data	
Temperature	−40° F to +185° F (−40° C to +85° C)
Impact Resistance	1 inch (25 mm) diameter hail at 52 mph (23 m/s)
Appearance	Class A
Solar Cells	72 Monocrystalline IBC cells
Tempered Glass	High-transmission tempered anti-reflective
Junction Box	IP-68, TE (PV4S)
Weight	40.5 lbs (18.4 kg)
Max. Load	Wind: 75 psf, 3600 Pa, 367 kg/m² front & back Snow: 125 psf, 6000 Pa, 612 kg/m² front
Frame	Class 2 silver anodized



FRAME PROFILE



(A) Cable Length: 1320 mm +/-10 mm [52 in +/-0.4 in]
(B) Long Side: 32 mm [1.3 in]
Short Side: 24 mm [0.9 in]

1 SunPower 450 W, 22.2% efficient, compared to a Conventional Panel on same-sized arrays (310 W, 16% efficient, approx. 2.0 m²), 4.9% more energy per watt (based on PVSyst pan files for avg US climate), 0.5%/yr slower degradation rate (Jordan, et. al. "Robust PV Degradation Methodology and Application." PVSC 2018).
2 Based on search of datasheet values from websites of top 20 manufacturers per IHS, as of January 2019.
3 #1 rank in "Fraunhofer PV Durability Initiative for Solar Modules: Part 3". PVTech Power Magazine, 2015. Campeau, Z. et al. "SunPower Module Degradation Rate," SunPower white paper, 2013.
4 A-Series panels additionally contribute to LEED Materials and Resources credit categories.
5 Standard Test Conditions (1000 W/m² irradiance, AM 1.5, 25° C). NREL calibration Standard: SOMS current, LACCS FF and Voltage.

See www.sunpower.com/company for more reference information.
For more details, see extended datasheet: www.sunpower.com/solar-resources.
Specifications included in this datasheet are subject to change without notice.

Please read the safety and installation guide.

SUNPOWER®

Monday March 22nd, 2021

Att: Community Development Enterprises
1104 Whitehall Street, Jackson, NT 38301

Dear Denny,

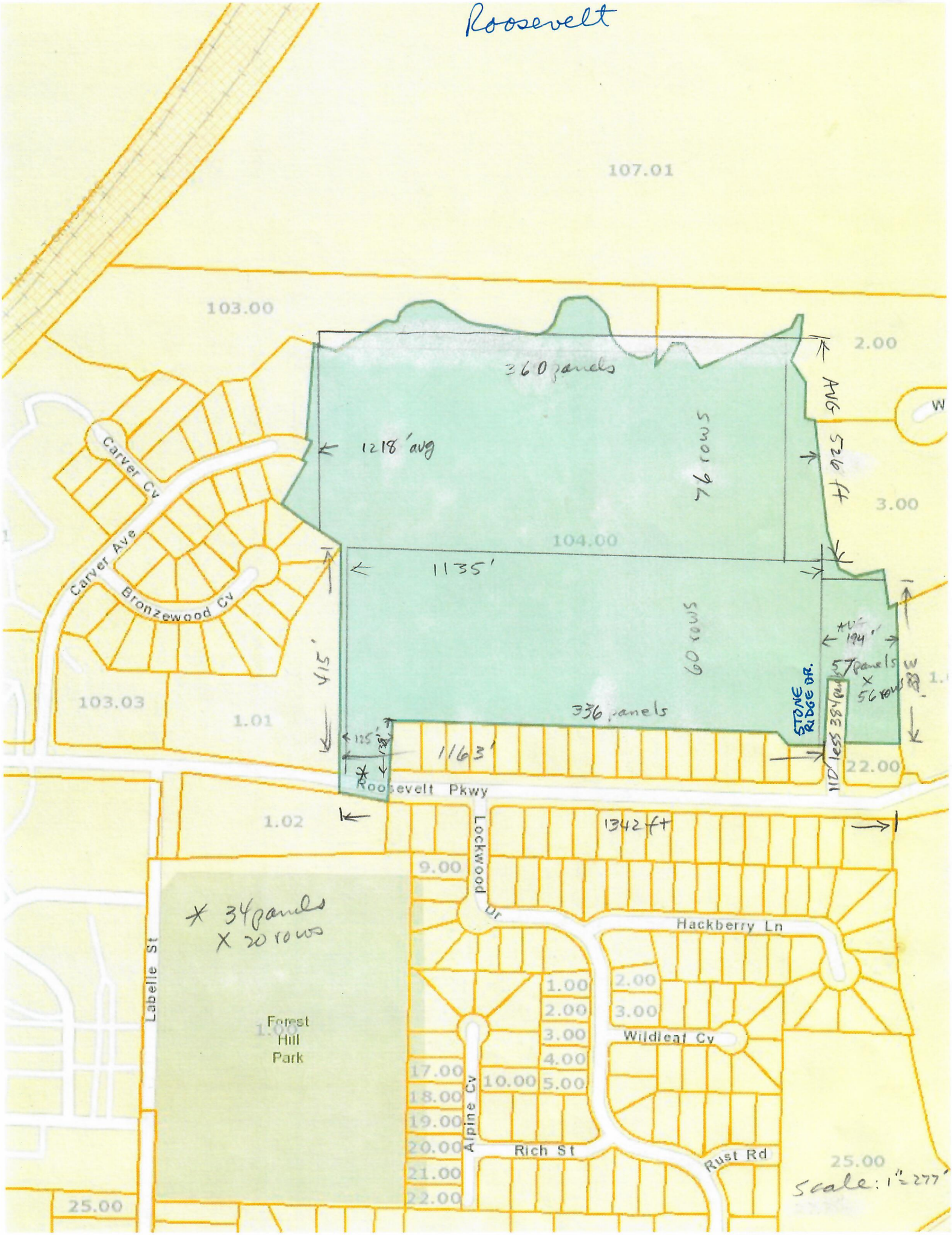
As per request:

1. Glare Analysis ; No glare will be reflected to nearby homes since the solar panels are a five-degree tilt.
2. EMF/EMI – There is no EMF or EMI of any significance, particularly that the services are quite far away from any public or residential location
3. Hazardous Materials – There are no materials which produce fumes coming off the panels, inverters, or transformers.
4. Decommission Plan – Together with NRI, each of our respective components would be able to be removed at the end of the lifespan of the facility. They would then be taken to recycling facilities. This would apply for solar panels, inverters, transformers, batteries, etc., each done by the respective provider, as part of a definitive contract.

Best regards,

Sass Peress
Chief Innovation and Experience Officer
iSun, Inc.

iSun Energy
400 Avenue D, Suite 10, Williston, Vermont, 05495
1-866-666-isun (4786)
www.isunenergy.com


Roosevelt
107.01
103.00
2.00
360 panels
AVG
1218' avg
76 rows
526 ft
3.00
Carver Cv
Carver Ave
Bronzewood Cv
104.00
1135'
60 rows
415'
+/- 194'
57 panels
x
56 rows
STONE RIDGE DR.
103.03
1.01
336 panels
1163'
22.00
Roosevelt Pkwy
1.02
1342 ft
9.00
Lockwood Dr
* 34 panels
X 20 rows
Hackberry Ln
Labelle St
Forest Hill Park
1.00
2.00
3.00
3.00
4.00
Wildleaf Cv
17.00
18.00
19.00
20.00
21.00
22.00
10.00
5.00
Alpine Cv
Rich St
Rust Rd
25.00
25.00
Scale: 1" = 277'

NRI000269

X SERIES

SUNPOWER®

SunPower X-Series: X21-470-COM

SunPower® Commercial DC Panel

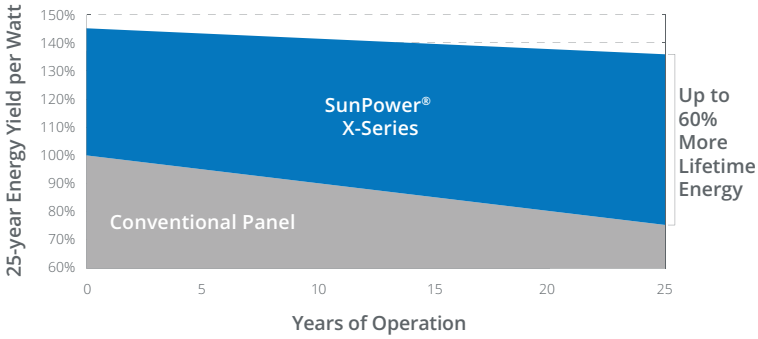
SunPower X-Series panels combine the top efficiency, durability and warranty available in the market today, resulting in more long-term energy and savings. [1,2]

Maximum Power. Minimalist Design.

Generates more power and savings per available space, making it easier to meet your organization's goals.

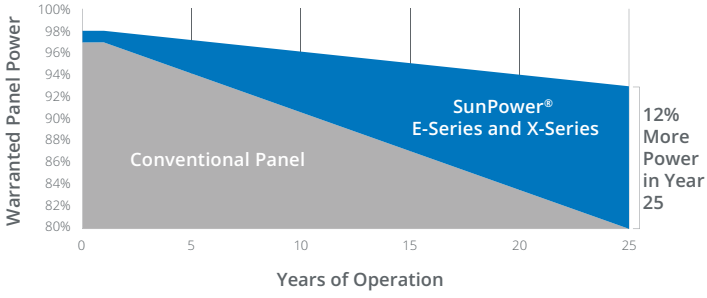
Highest Lifetime Energy and Savings

Designed to deliver 60% more energy in the same space over 25 years in real-world conditions like partial shade and high temperatures. [2]



Best Reliability, Best Warranty

With more than 25 million panels deployed around the world, SunPower technology is proven to last. That's why we stand behind our panel with the industry's best 25-year Combined Power and Product Warranty, including the highest Power Warranty in solar.



Fundamentally Different. And Better.

The SunPower Maxeon® Solar Cell

- Enables highest efficiency panels available [2]
- Unmatched reliability [3]
- Patented solid metal foundation prevents breakage and corrosion

As Sustainable As Its Energy

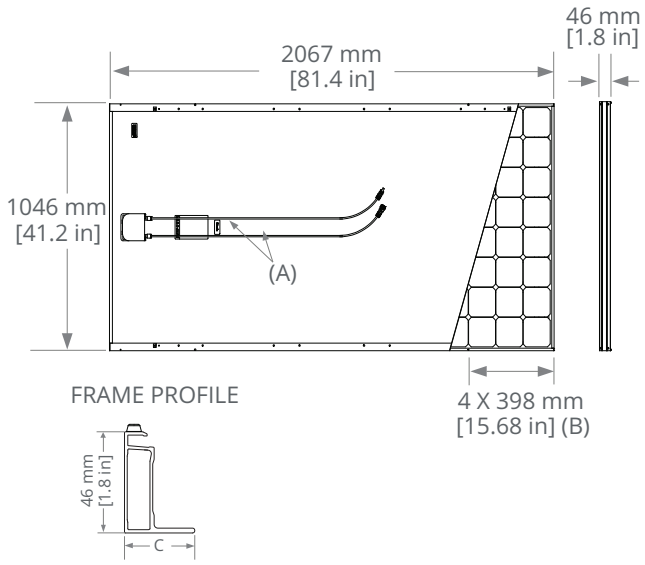
- Ranked #1 in Silicon Valley Toxics Coalition 2015 Solar Scorecard [4]
- First solar panels to achieve Cradle to Cradle Certified™ Silver recognition [5]
- Contributes to more LEED categories than conventional panels [6]

X-Series: X21-470-COM SunPower® Commercial DC Panel

Electrical Data		
	SPR-X21-470-COM	SPR-X21-460-COM
Nominal Power (Pnom) [7]	470 W	460 W
Power Tolerance	+5/0%	+5/0%
Panel Efficiency	21.7%	21.3%
Rated Voltage (Vmpp)	77.6 V	77.3 V
Rated Current (Impp)	6.06 A	5.95 A
Open-Circuit Voltage (Voc)	91.5 V	90.5 V
Short-Circuit Current (Isc)	6.45 A	6.39 A
Max. System Voltage	1000 V UL & 1000 V IEC	
Maximum Series Fuse	15 A	
Power Temp Coef.	−0.29% / ° C	
Voltage Temp Coef.	−223.2 mV / ° C	
Current Temp Coef.	2.9 mA / ° C	

Operating Condition And Mechanical Data	
Temperature	−40° F to +185° F (−40° C to +85° C)
Impact Resistance	1 inch (25 mm) diameter hail at 52 mph (23 m/s)
Appearance	Class A
Solar Cells	128 Monocrystalline Maxeon Gen III
Tempered Glass	High-transmission tempered anti-reflective
Junction Box	IP-65, 1230 mm cables / MC4 Compatible
Weight	56 lbs (25.4 kg)
Max. Load	Wind: 50 psf, 2400 Pa, 244 kg/m² front & back Snow: 112 psf, 5400 Pa, 550 kg/m² front
Frame	Class 2 silver anodized; stacking pins

Tests And Certifications	
Standard Tests [8]	UL1703 (Type 2 Fire Rating), IEC 61215, IEC 61730
Quality Management Certs	ISO 9001:2015, ISO 14001:2015
EHS Compliance	RoHS, OHSAS 18001:2007, lead free, Recycle Scheme, REACH SVHC-163
Sustainability	Cradle to Cradle Certified™ Silver. "Declare." listed.
Ammonia Test	IEC 62716
Desert Test	10.1109/PVSC.2013.6744437
Salt Spray Test	IEC 61701 (maximum severity)
PID Test	1000 V: IEC 62804, PVEL 600 hr duration
Available Listings	UL, TUV, MCS, FSEC, CEC



(A) Cable Length: 1230 mm +/-10 mm
(B) Stacking Pins
(C) Long Side: 32 mm [1.3 in]
Short Side: 22 mm [0.9 in]

Please read the safety and installation guide.

1 SunPower 360 W compared to a Conventional Panel on same-sized arrays (260 W, 16% efficient, approx. 1.6 m²), 4% more energy per watt (based on PVSyst pan files), 0.75%/yr slower degradation (Campeau, Z. et al. "SunPower Module Degradation Rate," SunPower white paper, 2013).
2 Based on search of datasheet values from websites of top 10 manufacturers per IHS, as of January 2017.
3 #1 rank in "Fraunhofer PV Durability Initiative for Solar Modules: Part 3". PVTech Power Magazine, 2015. Campeau, Z. et al. "SunPower Module Degradation Rate," SunPower white paper, 2013.
4 SunPower is rated #1 on Silicon Valley Toxics Coalition's Solar Scorecard.
5 Cradle to Cradle Certified is a multi-attribute certification program that assesses products and materials for safety to human and environmental health, design for future use cycles, and sustainable manufacturing.
6 X-Series and E-Series panels additionally contribute to LEED Materials and Resources credit categories.
7 Standard Test Conditions (1000 W/m² irradiance, AM 1.5, 25° C). NREL calibration Standard: SOMS current, LACCS FF and Voltage.
8 Type 2 fire rating per UL1703:2013, Class C fire rating per UL1703:2002.

See www.sunpower.com/company for more reference information.
For more details, see extended datasheet: www.sunpower.com/solar-resources.
Specifications included in this datasheet are subject to change without notice.

SUNPOWER®

Jackson Energy Authority 6/11/2020	Double click here to add/edit text. NRI000289	N W E S 1 in = 200 ft

JEA Requirements – Discussion between Denny Emberling and John Nanney JEA

Dear Gregg,

Here's the main email from John Nanney at JEA about their requirements.

Best,

Denny

-------- Forwarded Message --------

Subject:RE: FW: information about applying to construct a solar facility

Date: Thu, 11 Jun 2020 15:44:11 +0000

From: John Nanney <jnanney@jaxenergy.com>

To: Dennis Emberling <DE@MTRandC.com>

CC: Joey Coley <JCOLEY@jaxenergy.com>

Denny

Any inquiry about a large commercial project is brought to the attention of my work group. Since it also included "solar" it was specifically brought to my attention.

I can go ahead and answer those questions.

1. With exception of any utility lines located at the street where you may have frontage, we do not have any utility lines on that site with exception of possibly near the eastern boundary. We have a sewer line that follows the ditch east of your site (see attached) but, based on our drawings, it appears it does not run on your property (just depends on where your property line

is in relation to that ditch). Our database does not accurately reflect property lines so that would be confirmed when you have a survey of the property performed.

2. For large commercial developments, during the plan review process we may request a utility easement be included around the perimeter of the site (typically 20-25 feet). That request is based on what is submitted to the Planning Department and their review of the potential development of adjoining properties. Based on the availability of utilities for adjoining undeveloped areas, I do not anticipate we will request that for this site. If we did, the utility easement would fall within any setbacks required by zoning so it would not impact your development of the site.

John Nanney

Vice President, Economic and Industrial Development

Jackson Energy Authority

250 N. Highland

Jackson, TN 38301

(731) 422-7325

(731) 616-0157 (cell)

jnanney@jaxenergy.com

From: Dennis Emberling <DE@MTRandC.com>
Sent: Wednesday, June 10, 2020 5:27 PM
To: John Nanney <jnanney@jaxenergy.com>
Subject: Re: FW: information about applying to construct a solar facility

Dear John,

I didn't intend to bother you with this routine inquiry. I just wanted to know whether JEA has any pipelines or anything under the ground on our 28.54 acre parcel just north of the row of houses along Roosevelt Parkway about 1/4 mile west of Dr. F. E. Wright Drive. Also whether JEA has any utility easements to or across the property. I just asked Customer Service, and they said they'd have the appropriate person contact me. It has nothing to do with available electric service.

Could you please ask the appropriate person to call me?

Thanks,

Denny

On 6/10/2020 3:46 PM, John Nanney wrote:

Denny

I was contacted by one of our Customer Service Reps this morning regarding an inquiry you made concerning available electric service on Roosevelt Parkway. JEA has 12.47 kV 3-phase overhead service in that area. If you have any other questions regarding available electric service, you should direct those to Hameen Harris but, as he has previously noted, for a solar system the size you have been discussing, a system impact study will need to be done to provide much more technical information on our part.

John Nanney

Vice President, Economic and Industrial Development

Jackson Energy Authority

250 N. Highland

Jackson, TN 38301

(731) 422-7325

(731) 616-0157 (cell)

jnanney@jaxenergy.com

From: Dennis Emberling <DE@MTRandC.com>
Sent: Thursday, June 4, 2020 5:04 PM
To: Hameen Harris <hharris@jaxenergy.com>
Subject: Re: information about applying to construct a solar facility

Dear Hameen,

Thanks very much for all this information. Very helpful.

I'm not clear who the word "customer" (I put it in red) in item 2) below refers to: we, as the owners/operators of the solar facility, or the end user getting electricity both from us and from JEA? The customer is the end user.

And what if we do not interconnect to JEA/TVA at all, but neither do we supply 100% of end-users' power. We just connect to them behind their meters and supply some of their power. In this case, do we still need an interconnection agreement with JEA, system impact study, etc.? Yes, there will still need to be an interconnection agreement because of the possibility of supplying power back onto JEA's grid. If your solar is connected behind the meter, and JEA is connected in front of the meter, we are interconnected. Typically the owner/operator and customer are the same, so we may have to investigate what is the best way the agreement should be written if you connect to the customer side of the meter.

A system impact study of some proportion will still be needed regardless of size because of the possibility of supplying power to the grid, regardless if it is at multiple nodes or just one. Once the scope of the project is finalized, and a single line diagram can be produced, the magnitude of the system impact study can be determined. When you have theoretical numbers like 22MW, that leads JEA to believe an SIS is required.

In 1.b. below, I highlighted in red your phrase about federal mandates. According to FERC, NERC, and SERC, there are no such mandates. Especially if we are not interconnected to the JEA/TVA grid. What mandates are you thinking of? I interpreted your question that you wanted to sell electricity directly to the customer based on kwh and not go through JEA or TVA. I assumed that what rate structure and how that is metered would come under some federal regulation, I could be wrong. JEA has to have our rates approved by TVA, and TVA keep a close eye on our finances to make sure we are not overcharging customers.

But if FERC, NERC, and SERC have confirmed there are no policies to generate, transport, and sell power then I'd say that you have disproved my theory.

In 1.e. below, you refer to TVA's requirements for community solar, but TVA tells me they have no such requirements. And if we are not connected to the JEA/TVA grid, but are solely behind the meter, TVA says they have no requirements for us of any kind. Are they misinforming us? How can we make sure? I look at community solar as a solar farm that feeds directly into JEA's system, and an end use customer is able to purchase power based on the solar farms output, regardless if they are receiving power directly from the solar farm. Using JEA lines and infrastructure to transport solar

production to the end use customer would need to be part of a TVA project.

If you can refer me to any documents that would address these issues, that would be most helpful. If not, could you refer me to anyone or any department at TVA for definitive answers? I have been talking with Antonio Jones there, but have no documentation except their contract for their DPP program, which would be irrelevant if we don't interconnect to their grid.

Many thanks again,

Denny Emberling

On 5/28/2020 6:29 AM, Hameen Harris wrote:

Dennis,

My apologies, I just remembered I did not attach the interconnection agreements. See attached.

Hameen

From: Hameen Harris
Sent: Wednesday, May 27, 2020 9:44 AM
To: 'Dennis Emberling' <DE@MTRandC.com>
Subject: RE: information about applying to construct a solar facility

Dennis,

You can find JEA's answers to your questions below in the body of your previous email. I also wanted to clarify some things that may have not been covered in your questions or my answers below.

1. If your company wants to island a customer, where you will provide 100% of the customers power with no system ties or backup power from JEA. There are no regulations against that.

2. If your company provides behind the meter solar with JEA power as backup, there are no regulations against that. The**customer** will have to sign a JEA interconnection agreement and the end use customer would be subject to a rate for redundant power. That rate is currently under development.
3. A system impact study is a study that uses existing load data and JEA infrastructure to determine the impact generation such as solar will have on JEA's system. It also determines what upgrades if any are required and provides a cost estimate for such upgrades.
4. Any project that ties directly into a substation must be part of a TVA program.
5. JEA can only respond to JEA requirements for generation projects. TVA, FERC, and the City of Jackson Building Department would have to give you their requirements.

Let me know if you have any further questions.

Thanks,

Hameen Harris

From: Dennis Emberling <DE@MTRandC.com>
Sent: Friday, May 15, 2020 2:57 PM
To: Hameen Harris <hharris@jaxenergy.com>
Subject: information about applying to construct a solar facility

Dear Hameen,

I've been talking with John Nanney several times about our new plans to construct a community micro-grid solar facility in East Jackson, and he referred me to you for more information.

The project may be as large as 22 MW of ground-mounted solar panels on our 28.54 acre parcel on Roosevelt Parkway, about 500 feet west of Dr. F. E. Wright Drive.

We intend to supply behind-the-meter electricity to Lane College and a few heavy electricity users near the site, by wiring them directly from the solar facility. They will sublease a portion of the solar facility at a fixed monthly rate and receive a share of its energy production.

In addition, we intend to execute a Power Purchase Agreement with TVA to sell some of the energy

produced back to TVA via its Disbursed Power Program at its avoided cost rates. I have discussed this with Antonio Eugene Jones a number of times. We intend to apply for and be accepted as a Qualified Small Power Production Facility under FERC/PURPA.

John tells me JEA has two substations within a mile or 1.5 miles of our site, and that at least one of them probably has sufficient capacity to accommodate the input from our solar facility, which should be a fraction (a small one, we hope) of its total production.

I don't know whether the above is sufficient information to enable you to answer the questions below, but I'd be happy to provide more and/or discuss the project with you on the phone, if you'd call me at the number below.

Our starting questions are these:

1. Requirements from JEA, TVA, FERC, Jackson Building & Codes Dept., and whomever else will be involved:

a. I have been told that so long as we wire up users behind their meters directly, they can purchase electricity from us without violating any contracts or regulations. Right? There are some large commercial and industrial customers that have contracts with JEA for a minimal monthly demand that could result in penalties if they choose to offset their power bill. Once you have JEA customers that are interested in your program, and they give consent, we can investigate what penalties, if any, would occur based on the amount of solar generation they will have.

b. I have sometimes been told that they cannot pay directly for the electricity, say by the kWh, but must instead sublease a portion of our solar equipment. Right? JEA is regulated by TVA for the sale of electricity. Whether or not this is done by kWh sales or sublease would follow whatever federal mandates that are associated with power distribution and sales.

c. I have less often been told that they probably can't pay a rate per kWh, but must pay a flat fee, say monthly, for their sublease. Right? Unfortunately, I am unaware of who regulates the payment structure for this type project.

d. Do you happen to know (nobody has, so far) whether they must be hard-wired to certain solar panels and receive the energy from those panels alone, or whether they can be hard-wired to the whole solar facility and receive a share of its production according to their sublease agreements? I am unaware of how sublease agreements for solar power are to be installed.

e. Must our purchasers be within 1 mile of the solar facility, lest they not be considered part of that single facility? If you are connecting to a customer behind their meter, you would have to construct electric lines to their facility. For a community solar arrangement, JEA can only use TVA power to distribute on JEA power lines across the system. This project would have to be in partnership with TVA and follow whatever requirements they have for community solar.

2. Process, applications, permits, documents required: what do we need to send to whom and by when? How long do the various steps take to be finalized? I have attached copies of JEA's interconnection agreement, they would need to be filled out along with a single line diagram of the proposed site. All of the electrical designs would need to me stamped and approved by a Professional Engineer in the State of Tennessee. Permitting would be done through the City of Jackson for building and electrical permits. Any work done on City Right of Way would also require the proper permits required by the City of Jackson. The application can be sent to my attention.

30 days for JEA to review plans

90 days for a System impact Study

30 days for JEA to review System Impact Study

180 days (estimate) for TVA System Impact Study (if required)

1. What is the cost to apply for interconnection? The system impact study would be paid by the developer and they are around $30k. The developer would also be responsible for all construction cost at the point of interconnection

2. Can you give any estimate for the cost to interconnect to whichever of your two nearby substations will be better, again taking capacity into account for our maximum 22 MW? Your single line diagram and the system impact study will dictate the cost to interconnect.

3. If most of that is being used by our nearby commercial users and only say 5 MW ever goes back to the grid, does that change which substation and the costs to interconnect? Once again, the system impact study will confirm the size and location. But typically the size of the interconnect is proportionate to the cost.

M T R & C

Management & Technical
Research & Consulting

Dennis Emberling, Senior Consultant
M T R & C LLC
5548 Trousdale Dr., Brentwood, TN 37027
Email: DE@MTRandC.com
Direct: (615) 265-9101

COMMUNITY
DEVELOPMENT
ENTERPRISES

Dennis Emberling, CEO
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DE@ComDevEnt.com
(731) 240-5001

Jackson Energy Authority 6/11/2020	Double click here to add/edit text. NRI000299	N W E S 1 in = 200 ft

Power Contract

SEE Supp 21, 10/1/89

TV-47356A

See TV-47356A Supp. No. 28 6/21/91

See TV-47356A, S. 29, 3-1-92

See Supp 46, 3/1/96. See Supp. No. 48, 10/2/96

POWER CONTRACT
Between
TENNESSEE VALLEY AUTHORITY
And
CITY OF JACKSON, TENNESSEE

THIS CONTRACT, made and entered into as of the 12th day of August, 1977, by and between TENNESSEE VALLEY AUTHORITY (hereinafter called "TVA"), a corporation created and existing under and by virtue of the Tennessee Valley Authority Act of 1933, as amended (hereinafter called "TVA Act"), and CITY OF JACKSON (hereinafter called "Municipality"), a municipal corporation duly created, organized, and existing under and by virtue of the laws of the State of Tennessee;

W I T N E S S E T H:

WHEREAS, the TVA Act authorizes TVA to sell the power generated by it and not used in its operations to States, counties, municipalities, corporations, partnerships, or individuals according to the policies therein set forth; and

WHEREAS, the TVA Act provides that the sale of such power shall be primarily for the benefit of the people of the section as a whole and particularly the domestic and rural consumers, to whom it is desired to make power available at the lowest possible rates; and

WHEREAS, Municipality owns an electric system which is managed and operated by a board of utility commissioners (hereinafter called "Board") and in the operation thereof is presently purchasing and desires to continue to purchase its entire power requirements from TVA; and

WHEREAS, the parties wish to enter into a new contract to replace their present power contract;

NOW, THEREFORE, in consideration of the mutual promises herein contained and subject to the provisions of the TVA Act, the parties agree as follows:

1. Purpose of Contract. It is hereby recognized and declared that, pursuant to the obligations imposed by the TVA Act, Municipality's operation of a municipal electric system and TVA's wholesale service thereto are primarily for the benefit of the consumers of electricity. Toward that end, Municipality agrees that the electric system shall be operated on a nonprofit basis, and that electric system funds and accounts shall not be mingled with other funds or accounts of Municipality. Municipality may, as hereinafter provided, receive from the operation thereof for the benefit of its general funds only an amount in lieu of taxes representing a fair share of the cost of government properly to be borne by such system. In accordance with these principles, which are mutually recognized as of the essence of this contract, Municipality agrees that the electric system shall be operated and the system's financial accounts and affairs shall be maintained in full and strict accordance with the provisions of this contract.

2. Power Supply.

(a) Subject to the other provisions of this contract, TVA shall produce and deliver to Municipality at the delivery point or points specified in or hereafter established under section 3 hereof and Municipality shall take and distribute the electric power required for service to Municipality's customers. Municipality shall keep TVA currently informed of any important developments affecting its probable future loads or service arrangements. TVA shall take account of all available information in making its forecasts of the loads of Municipality and of TVA's other customers. TVA shall make every reasonable effort to increase the generating capacity of its system and to provide the transmission facilities required to deliver the output thereof so as to be in a position to supply additional power therefrom when and to the extent needed to meet increases in their loads.

(b) Municipality shall be entitled to use the power made available hereunder to serve all consumers to whom the resale rate schedules specified in section 5(b) hereof are applicable except those TVA is entitled to serve directly, as provided below. TVA shall be entitled to serve directly any consumer to whom said resale rate schedules are not applicable, any federal installations excepting those with loads less than 5,000 kilowatts served from a general delivery point, and any consumer whose energy requirements in any month are more than 10 million kilowatthours plus the amount of energy, if any, delivered by Municipality to residential consumers under billings for the preceding June and received from TVA at the delivery point through which Municipality would receive the energy for such consumer if it were served by Municipality. The supply of power by TVA to Municipality for resale to any consumer which has a supply of 5,000 kilowatts or more of power other than that furnished by Municipality under said resale rate schedules, and the contract for such resale between Municipality and such consumer, shall be subject to such special arrangements as TVA may reasonably require. Nothing herein shall be construed as preventing Municipality and TVA from agreeing upon special arrangements for service to any consumer.

(c) It is recognized that from time to time there may be a consumer served by one party hereto which, because of changed conditions, may become a consumer which the other party is entitled to serve under the provisions of subsection (b) of this section. In any such case the parties hereto, unless otherwise agreed, shall make such arrangements (including making appropriate allowance for any otherwise unrecoverable investment made to serve such consumer) as may be necessary to transfer as soon as practicable such consumer to the party entitled to serve the consumer hereunder and the party originally serving said consumer shall cooperate in every way with the party entitled to serve the consumer in making arrangements for the latter to undertake such service including, without limitation, releasing the consumer from any then existing power contract from and after the effective date for initiating service under any contract between such consumer and the party entitled to serve it.

(d) Municipality shall keep TVA informed of any prospective developments affecting any individual load which uses or will use 5,000 kilowatts or more. As soon as practicable after receipt of information from Municipality regarding the prospective addition of, or increase in, any load of 5,000 kilowatts or larger which Municipality would be entitled to serve hereunder, TVA

shall notify Municipality of the time schedule upon which the additional power required for such service could be made available to Municipality at the wholesale rates then in effect hereunder and, upon request, of any terms under which it could supply any power in advance of said schedule. Municipality shall not take and deliver such additional power for said load in advance of or in amounts larger than specified in said schedule except to the extent that it has made special arrangements with TVA to do so. TVA, by notice in writing to Municipality, may change the designated amount of 5,000 kilowatts appearing in this subsection (d) to such other amount as TVA deems necessary.

(e) The area limitations in the first three paragraphs of subsection (a) of section 15d of the TVA Act are incorporated herein by reference as fully as though set out herein, and this contract shall not be construed as permitting any arrangement by Municipality which would be inconsistent with those limitations.

(f) Notwithstanding any other provision of this section, TVA may, as a condition precedent to TVA's obligation to make power available, require Municipality to provide such assurances of revenue to TVA as in TVA's judgment may be necessary to justify the reservation, alteration, or installation by TVA of additional generation, transmission, or transformation facilities for the purpose of supplying power to Municipality.

3. Delivery and Receipt of Power. The power to be supplied hereunder shall be delivered at the delivery points designated below and, under normal operating conditions, shall be within commercial limits of 60 hertz and within 3 percent above or below the normal wholesale delivery voltage specified below for each delivery point; provided, however, that any normal wholesale delivery voltage of 46 kV or higher specified below may be changed by TVA from time to time upon notice to Municipality to a voltage level not more than 5 percent higher or lower than the voltage so specified. Substation transformers with a high-side voltage rating of 46 kV or above will be equipped with taps or other suitable means for adjusting for the changes in normal voltage set forth herein. The operating representatives of the parties may by mutual agreement provide for variations in wholesale delivery voltage other than those provided for herein when in their judgment such variations are necessary or desirable.

161-KV SIDE of the CARRIAGE HOUSE 161-KV SUBSTATION 161,000 (Supp. 47, 6/21/96)

Delivery Point	Normal Wholesale Delivery Voltage
161-KV bus connection at TVA's Madison West 161-KV Switching Station 161,000, dated 5/6/98, Supp. 55	
46-kV side of TVA's South Jackson 161-kV Substation	46,000

*

It is recognized that load growth and development and the maintenance of high quality service in Municipality's area may require new delivery points from time to time. Such new delivery points will be established by mutual agreement. In reaching such agreement Municipality and TVA shall be guided by the policy of providing the most economical of the practical combinations of transmission and distribution facilities, considering all pertinent factors, including any unusual factors applicable to the area involved.

*Point of connection of Municipality's 161-kV bus at TVA's Madison West 161-kV Switching Station for Delivery Point 1

(See S# 18, dated 4-8-88)

Neither party shall be responsible for installing at any delivery point equipment for the protection of the other's facilities, or for damages to the other's system resulting from the failure of its own protective devices, but each party agrees so to design, construct, and operate its system as not to cause undue hazards to the other's system.

4. Wholesale Rate. Attached hereto and made a part hereof is a "Schedule of Rates and Charges" wherein Municipality is referred to as "Distributor." Subject to the other provisions of this contract, Municipality shall pay for the power and energy supplied by TVA in accordance with the provisions of Wholesale Power Rate--Schedule WS.

The payments to be made hereunder shall be made solely and exclusively from the revenues of the electric system and shall not be a charge upon Municipality's general funds.

5. Resale Rates. In distributing electric energy in the area served by Municipality, the parties agree as follows:

(a) Municipality agrees that the power purchased hereunder shall be sold and distributed to the ultimate consumer without discrimination among consumers of the same class, and that no discriminatory rate, rebate, or other special concession will be made or given to any consumer, directly or indirectly.

(b) Municipality agrees to serve consumers, including all municipal and governmental customers and departments, at and in accordance with the rates, charges, and provisions set forth for the several classes thereof in Schedules RS-10, GS-10, and LS of said Schedule of Rates and Charges, and not to depart therefrom except as the parties hereto may agree upon surcharges, special minimum bills, or additional resale schedules for special classes of consumers or special uses of electric energy, and except as provided in subsection (c) next following.

For the purpose of uniform application, within the classes of consumers, of the provisions of the paragraph entitled "Payment" of said resale schedules, Municipality shall designate in its standard policy a period of not less than 10 days nor more than 20 days after date of the bill during which period the bill is payable as computed by application of the charges for service under the appropriate resale schedule, and shall further designate in said policy the percentage or percentages, if any, not to exceed 10 percent of the bill, computed as above provided, which will be added to the bill as additional charges for payment after the period so designated.

(c) If the rates and charges provided for in said resale schedules do not produce revenues sufficient to provide for the operation and maintenance of the electric system on a self-supporting and financially sound basis, including requirements for interest and principal payments on indebtedness incurred or assumed by Municipality for the acquisition, extension, or improvement of the electric system (hereinafter called "System Indebtedness"), Board and TVA shall agree upon, and Municipality shall put into effect promptly, such

changes in rates and charges as will provide the increased revenues necessary to place the system upon a self-supporting and financially sound basis. If the rates and charges in effect at any time provide revenues that are more than sufficient for such purposes, as more particularly described in section 6 hereof, Board and TVA shall agree upon a reduction in said rates and charges, and Municipality shall promptly put such reduced rates and charges into effect.

6. Use of Revenues.

(a) Municipality agrees to use the gross revenues from electric operations for the following purposes:

(1) Current electric system operating expenses, including salaries, wages, cost of materials and supplies, power at wholesale, and insurance;

(2) Current payments of interest on System Indebtedness, and the payment of principal amounts, including sinking fund payments, when due;

(3) From any remaining revenues, reasonable reserves for renewals, replacements, and contingencies; and cash working capital adequate to cover operating expenses for a reasonable number of weeks; and

(4) From any revenues then remaining, tax equivalent payments into Municipality's general funds, as more particularly provided in section 2 of the Schedule of Terms and Conditions hereinafter referred to.

(b) All revenues remaining over and above the requirements described in subsection (a) of this section shall be considered surplus revenues and may be used for new electric system construction or the retirement of System Indebtedness prior to maturity; provided, however, that resale rates and charges shall be reduced from time to time to the lowest practicable levels considering such factors as future circumstances affecting the probable level of earnings, the need or desirability of financing a reasonable share of new construction from such surplus revenues, and fluctuations in debt service requirements.

7. Equal Opportunity. It is the policy of the federal government to provide equal employment opportunity, and in furtherance of that policy, it is the policy of TVA, as an agency of the federal government, to encourage equal employment opportunity in the various aspects of its programs, including the sale and distribution of TVA power. Accordingly, during the term of this power contract:

(a) Municipality will not discriminate against any employee or applicant for employment with its electric system because of race, color, religion, sex, or national origin. Municipality will take such affirmative action as is necessary to insure that all applicants are considered for employment and that all employees are treated in all aspects of employment without regard to their race, color, religion, sex, or national origin.

(b) Municipality will, in all solicitations or advertisements for employees placed by or on behalf of the electric system, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.

(c) Municipality will cooperate and participate with TVA in the development of training and apprenticeship programs which will provide opportunities for applicants and prospective applicants for employment with the electric system to become qualified for such employment, and such cooperation will include access by authorized TVA representatives to its electric system's books, records, and accounts pertaining to training, apprenticeship, recruitment, and employment practices and procedures.

8. Terms and Conditions. Certain additional provisions of this contract are set forth in a "Schedule of Terms and Conditions," which is attached hereto and made a part hereof.

9. Rules and Regulations. Municipality hereby adopts the "Schedule of Rules and Regulations" attached hereto, in which Municipality is referred to as "Distributor." Such Rules and Regulations may be amended, supplemented, or repealed by Municipality at any time upon 30 days' written notice to TVA setting forth the nature of and reason for the proposed change. No change shall be made in said schedule, however, which is in violation of or inconsistent with any of the provisions of this contract.

10. Use of Lines for Transmission Purposes. TVA is hereby granted the privilege of using any electric lines of Municipality, to the extent of their capacity in excess of the requirements of Municipality, for the purpose of transmitting electric energy between adjoining portions of TVA's facilities or to other customers of TVA. TVA shall be obligated to pay Municipality the additional cost, including any additional fixed charges and operating and maintenance costs, imposed on Municipality by permitting use of its facilities to serve other customers of TVA, and to indemnify and save harmless Municipality from any damage or injury caused by TVA's exercise of such use.

11. Waiver of Defaults. Any waiver at any time by either party hereto of its rights with respect to any default of the other party or with respect to any other matter arising in connection with this contract shall not be considered a waiver with respect to any subsequent default or matter.

12. Transfer of Contract. Neither this contract nor any interest herein shall be transferable or assignable by Municipality without the consent of TVA.

13. Restriction of Benefits. No member of or delegate to Congress or resident commissioner or any agent or employee of TVA shall be admitted to any share or part of this contract or to any benefit to arise therefrom. However, nothing contained in this section shall be construed to extend to any citizen of Municipality under arrangements for the general benefit of Municipality.

14. Termination of Existing Contracts. It is hereby agreed that the power contract dated April 1, 1957, and numbered TV-19330A, as supplemented and amended, between the parties is terminated as of the effective date of this contract; provided, however, that nothing herein contained shall be construed as

effecting the termination of (1) Lease-Purchase Agreement TV-19330A, Supplement No. 12, dated November 30, 1976, between the parties hereto relative to the lease and eventual purchase by Municipality of sections of TVA's South Jackson-Humboldt and South Jackson-Morris 46-kV Transmission Lines and (2) section 3 of Agreement TV-19330A, Supplement No. 10, dated December 28, 1976, between the parties hereto relative to application of a monthly facilities rental credit to billings under Wholesale Power Rate--Schedule WS, it being the intention of the parties that each of said agreements, or portions thereof, shall remain in full force and effect for the term of this contract unless sooner terminated in accordance with the provisions of each agreement. All references in said agreements or portions thereof, to the power contract dated April 1, 1957, shall be deemed to refer to this contract.

15. Term of Contract. This contract shall become effective as of September 1, 1977, and shall continue in effect for 20 years from said date, subject to termination by either party, effective not earlier than 10 years from said date, on not less than four years' prior written notice. If Municipality should give notice of termination hereunder, TVA shall be under no obligation from the date of receipt of such notice to make or complete any additions to or changes in any transformation or transmission facilities for service to Municipality unless Municipality agrees to reimburse TVA for its nonrecoverable costs in connection with the making or completion of such additions or changes.

IN WITNESS WHEREOF, the parties hereto have caused this contract to be executed by their duly authorized officers, as of the day and year first above written.

Approved by TVA
Board of Directors
AUG 25 1977
s/ M.E.
Assistant Secretary

Attest: (SEAL)

TENNESSEE VALLEY AUTHORITY

s/ Madge Evans
Assistant Secretary

By s/ Lynn Seeber
General Manager

s/ JMc
Law

Attest:

CITY OF JACKSON, TENNESSEE
By Board of Utility Commissioners

s/ Joe H. Exum
(Title) General Manager

By s/ James W. Hoppers
Chairman

Attest:

Approved:
CITY OF JACKSON, TENNESSEE

s/ James A. Wolfe, Jr.
(Title) City Recorder

By s/ Robert D. Conger
Mayor

Outdoor Lighting

OUTDOOR LIGHTING RATE--SCHEDULE LS
(October 1976)

Availability

Available for service to street and park lighting systems, traffic signal systems, athletic field lighting installations (during prescribed use-period), and outdoor lighting for individual customers.

Service under this schedule is for a term of not less than one year.

PART A—CHARGES FOR STREET AND PARK LIGHTING SYSTEMS, TRAFFIC SIGNAL SYSTEMS, AND ATHLETIC FIELD LIGHTING INSTALLATIONS

I. Energy Charge: 1.984 cents per kilowatthour as increased or decreased in accordance with Appendix I to the Schedule of Rates and Charges

Adjustment

The customer's bill for each month shall be increased or decreased in accordance with the current Adjustment Addendum published by TVA.

II. Investment Charge

The annual investment charge shall be 10 percent of the installed cost to Distributor's electric system of the facilities devoted to street and park lighting service specified in this Part A. Such installed cost shall be recomputed on July 1 of each year, or more often if substantial changes in the facilities are made. Each month, one-twelfth of the then total annual investment charge shall be billed to the customer. If any part of the facilities has not been provided at the electric system's expense or if the installed cost of any portion thereof is reflected on the books of another municipality or agency or department, the annual investment charge shall be adjusted to reflect properly the remaining cost to be borne by the electric system.

Traffic signal systems and athletic field lighting installations shall be provided, owned, and maintained by and at the expense of the customer, except as Distributor may agree otherwise in accordance with the provisions of the paragraph next following in this Section II. The facilities necessary to provide service to such systems and installations shall be provided by and at the expense of Distributor's electric system, and the annual investment charge provided for first above in this Section II shall apply to the installed cost of such facilities.

When so authorized by policy duly adopted by Distributor's governing board, traffic signal systems and athletic field lighting installations may be provided, owned, and maintained by Distributor's electric system for the customer's benefit. In such cases Distributor may require reimbursement from the customer for a portion of the initial installed cost of any such system or installation and shall require payment by the customer of an investment charge sufficient to cover all of Distributor's costs (except reimbursed costs), including appropriate overheads, of providing, owning, and maintaining such system or installation; provided that, for athletic field lighting installations, such investment charge shall in no case be less than 12 percent per year of such costs. Said investment charge shall be in addition to the annual investment charge on the facilities necessary to provide service to such system or installation as provided for in the preceding paragraph. Replacement of lamps and related glassware for traffic signal systems and athletic field lighting installations provided under this paragraph shall be paid for under the provisions of paragraph A in Section III.

III. Replacement of Lamps and Related Glassware - Street and park lighting.

Customer shall be billed and shall pay for replacements as provided in paragraph A below, which shall be applied to all service for street and park lighting.

A. Distributor shall bill the customer monthly for such replacements during each month at Distributor's cost of materials, including appropriate storeroom expense.

B. Distributor shall bill the customer monthly for one-twelfth of the amount by which Distributor's cost of materials, including appropriate storeroom expense, exceeds the product of 3 mills multiplied by the number of kilowatthours used for street and park lighting during the fiscal year immediately preceding the fiscal year in which such month occurs.

Metering

For any billing month or part of such month in which the energy is not metered or for which a meter reading is found to be in error or a meter is found to have failed, the energy for billing purposes for that billing month or part of such month shall be computed from the rated capacity of the lamps (including ballast) plus 5 percent of such capacity to reflect secondary circuit losses, multiplied by the number of hours of use.

Use-Period For Athletic Field Lighting

Service to athletic field lighting installations under this rate schedule shall not commence earlier than 7 p.m., except that the customer may be permitted to use up to 10 percent (not to exceed 10 kilowatts) of the total installed lighting capacity prior to commencement of such period. In the event the customer fails to restrict service in accordance with these requirements, it shall be billed under the General Power Rate.

Revenue and Cost Review

Distributor's costs of providing service under Part A of this rate schedule are subject to review at any time and from time to time to determine if Distributor's revenues from the charges being applied are sufficient to cover said costs. If any such review discloses that revenues are either less or more than sufficient to cover said costs, Distributor shall revise the above investment charges so that revenues will be sufficient to cover said costs. Any such revision of the annual investment charge provided for first above in Section II of Part A of this rate schedule shall be by agreement between Distributor and TVA.

PART B—CHARGES FOR OUTDOOR LIGHTING FOR INDIVIDUAL CUSTOMERS

Charge Per Fixture

Type of Fixture	Lamp Size (Watts)	Base Monthly Charge
Mercury Vapor or Incandescent*	175	$ 3.00
	250	3.50
	400	4.75
	700	7.75
	1,000	10.00
High Pressure Sodium	100	3.50
	150	3.75
	250	5.00
	400	6.50
	1,000	14.00

*Incandescent fixtures not offered for new service.

The above charges in this Part B are limited to service from a photoelectrically controlled standard street lighting fixture installed on a pole already in place. If the customer wishes to have the fixture installed at a location other than on a pole already in place, Distributor may apply a monthly charge not to exceed $2.00 per pole for additional poles required to serve the fixture from Distributor's nearest available source. Distributor may uniformly adjust the above base monthly charges up or down by an amount not to exceed $1.00.

When so authorized by policy duly adopted by Distributor's governing board, special outdoor lighting installations may be provided, owned, and maintained by Distributor's electric system. In such cases Distributor may require reimbursement from the customer for a portion of the initial installed cost of any such installation and shall require payment by the customer of monthly charges sufficient to cover all of Distributor's costs (except reimbursed costs), including appropriate overheads, of providing, owning, and maintaining such installations.

Lamp Replacements

Replacements of lamps and related glassware will be made in accordance with replacement policies of Distributor without additional charge to the customer.

Payment

Bills under this rate schedule will be rendered monthly. Any amount of bill unpaid after due date specified on bill may be subject to additional charges under Distributor's standard policy.

Service is subject to Rules and Regulations of Distributor.

GENERAL POWER RATE--SCHEDULE GS-10
(October 1976)

Availability

This rate shall apply to the firm power requirements for electric service to commercial, industrial, and governmental customers; institutional customers including, without limitation, churches, clubs, fraternities, orphanages, nursing homes, rooming or boarding houses, and like customers; and other customers except those to whom service is available under other resale rate schedules.

Character of Service

Alternating current, single or three-phase, 60 hertz. Under A below power shall be delivered at a voltage available in the vicinity or agreed to by Distributor. Under B below power shall be delivered at a transmission voltage of 161 kV or, if such transmission voltage is not available, at the highest voltage available in the vicinity, unless at the customer's request a lower standard voltage is agreed upon.

Base Charges

A. If the customer's demand for the month and its contract demand, if any, are each 5,000 kilowatts or less:

Customer Charge: $3.10 per delivery point per month

Demand Charge:

First 50 kilowatts of demand per month, no demand charge
Next 50 kilowatts of demand per month, at $1.90 per kilowatt
Excess over 100 kilowatts of demand per month, at $2.20 per kilowatt

Energy Charge:

First 500 kilowatthours	per	month	at	2.523	cents	per	kWh*
Next 14,500	"	"	"	2.103	"	"	kWh*
Next 25,000	"	"	"	1.237	"	"	kWh*
Next 60,000	"	"	"	1.147	"	"	kWh*
Next 400,000	"	"	"	1.047	"	"	kWh*
Additional	"	"	"	1.007	"	"	kWh*

*as increased or decreased in accordance with Appendix I to the Schedule of Rates and Charges

B. If either the customer's demand for the month or its contract demand is greater than 5,000 kilowatts:

Customer Charge: $1,000 per delivery point per month

Demand Charge: $1.91 per kilowatt of demand per month

Additional charge for any demand in excess of customer's contract demand: $1.91 per kilowatt per month

Energy Charge: 0.993 cent per kilowatthour per month as increased or decreased in accordance with Appendix I to the Schedule of Rates and Charges

Facilities Rental Charge Applicable Under B Above

There shall be no facilities rental charge under this rate schedule for delivery at bulk transmission voltage levels of 161 kV or higher. For delivery at less than 161 kV, there shall be added to the customer's bill a facilities rental charge. This charge shall be 20 cents per kW per month except for delivery at voltages below 46 kV, in which case the charge shall be 55 cents per kW per month for the first 10,000 kW and 30 cents per kW per month for the excess over 10,000 kW. Such charge shall be applied to the customer's currently effective contract demand and shall be in addition to all other charges under this rate schedule including minimum bill charges.

Adjustment

The customer's bill for each month shall be increased or decreased in accordance with the current Adjustment Addendum published by TVA.

Determination of Demand

Distributor shall measure the demands in kilowatts of all customers having loads in excess of 50 kilowatts. The demand for any month shall be the higher of the highest average during any 30-consecutive-minute period of the month of (a) the load measured in kilowatts or (b) 85 percent of the load in kVA plus an additional 10 percent for that part of the load over 5,000 kVA, and such amount shall be used as the billing demand except that, under B above, the billing demand for any month shall in no case be less than the sum of (1) 40 percent of the first 5,000 kilowatts, (2) 70 percent of the next 45,000 kilowatts, and (3) 90 percent of all kilowatts in excess of 50,000 kilowatts of the higher of the currently effective contract demand or the highest billing demand established during the preceding 12 months.

Minimum Bill

The monthly bill under A above shall [illegible]

RESIDENTIAL RATE--SCHEDULE RS-10
(October 1976)

Availability

This rate shall apply only to electric service to a single family dwelling and its appurtenances, where the major use of electricity is for domestic purposes such as lighting, household appliances, and the personal comfort and convenience of those residing therein. Any such dwelling in which space is occasionally used for the conduct of business by a person residing therein may be served under this rate. Where a portion of a dwelling is used regularly for the conduct of business, the electricity consumed in that portion so used shall be separately metered and billed under the General Power Rate; if separate circuits are not provided by the customer, service to the entire premises shall be billed under the General Power Rate.

Character of Service

Alternating current, single-phase, 60 hertz. Voltage supplied shall be at the discretion of Distributor and shall be determined by the voltage available from distribution lines in the vicinity and/or other conditions. Multi-phase service shall be supplied in accordance with Distributor's standard policy.

Base Charges

Customer Charge: $2.10 per delivery point per month

Energy Charge:
First 500 kilowatthours per month at 1.847 cents per kilowatthour*
Additional " " " " 1.717 " " kilowatthour*

*as increased or decreased in accordance with Appendix I to the Schedule of Rates and Charges

Adjustment

The customer's bill for each month shall be increased or decreased in accordance with the current Adjustment Addendum published by TVA.

Minimum Monthly Bill

The customer charge constitutes the minimum monthly bill for all customers served under this rate schedule except those customers for which a higher minimum monthly bill is required under Distributor's standard policy because of special circumstances affecting Distributor's cost of rendering service.

Payment

Bills under this rate schedule will be rendered monthly. Any amount of bill unpaid after due date specified on bill may be subject to additional charges under Distributor's standard policy.

Single-Point Delivery

The charges under this rate schedule are based upon the supply of service through a single delivery and metering point, and at a single voltage. If service is supplied to the same customer through more than one point of delivery or at different voltages, the supply of service at each delivery and metering point and at each different voltage shall be separately metered and billed under this rate schedule.

Service is subject to Rules and Regulations of Distributor.

TENNESSEE VALLEY AUTHORITY
SCHEDULE OF RATES AND CHARGES

WHOLESALE POWER RATE--SCHEDULE WS
(October 1976)

Availability

Firm power available under long-term contracts with, and for distribution and resale by, States, counties, municipalities, and cooperative organizations of citizens or farmers, all referred to herein as "Distributor."

Base Charges

Delivery Point Charge:	$1,500 per delivery point per month
Demand Charge:	$1.81 per kilowatt of demand per month
Energy Charge:	0.950 cent per kilowatthour per month as increased or decreased in accordance with Appendix I to the Schedule of Rates and Charges

Adjustments

1. Distributor's bill for each month shall be increased or decreased in accordance with the current Adjustment Addendum published by TVA.

2. Distributor's bill for each month shall be adjusted by adding to the bill 10 cents per kW and 0.02 cent per kWh for power and energy resold by Distributor in the preceding month to any consumer which has a billing demand of more than 10,000 kW or which uses more than 5 million kWh (herein referred to as a large load), except that such adjustment shall not apply to any portion of a large load up to the following respective amounts: 10,000 kW plus an amount (not to exceed 20,000 kW) equal to that portion of Distributor's demand at the TVA delivery point from which such large load is served by Distributor which is in excess of the sum of the billing demands of all large loads served by Distributor from that delivery point; 5 million kWh plus an amount (not to exceed 15 million kWh) equal to that portion of Distributor's purchases of energy at the TVA delivery point from which such large load is served by Distributor which is in excess of the energy resold to all large loads served by Distributor from that delivery point.

Determination of Demand

The demand for any month shall be the highest average during any 60-consecutive-minute period of the month of (a) the load measured in kilowatts or (b) 85 percent of the load in kVA plus 10 percent of the excess over 5,000 kVA of the maximum kVA demand for the month for each individual consumer, whichever is the higher.

Facilities Rental

There shall be no facilities rental charge under this rate schedule for delivery at bulk transmission voltage levels of 161 kV or higher. For delivery at less than 161 kV, there shall be added to Distributor's bill a facilities rental charge. This charge shall be 20 cents per kW per month, except for delivery at voltages below 46 kV, in which case the charge shall be 55 cents per kW per month for the first 10,000 kW and 30 cents per kW per month for the excess over 10,000 kW. Such charge shall be applied to the highest billing demand established at each delivery point during the latest 12-consecutive-month period and shall be in addition to all other charges under this rate schedule including minimum bill charges.

Minimum Bill

The monthly bill, exclusive of Adjustment 2, shall not be less than the higher of (1) the base delivery point charge or (2) 70 percent of the highest billing demand established during the previous 36 months multiplied by the base demand charge (adjusted for the portion of the current Adjustment Addendum applicable to the Distributor's billing demand as provided in Adjustment 1 above). At Distributor's request, in lieu of such minimum bill being applied individually in the case of two or more delivery points through each of which less than half of the energy taken by Distributor is resold to lighting and power consumers with demands of 50 kW or more, the minimum bill, exclusive of Adjustment 2, for any month for such delivery points, considered together, shall instead be an amount equal to the sum of the minimum bills which would otherwise have been applicable to such delivery points for such month; provided, however, that a special minimum bill shall be applied for any delivery point through which more than 75 percent of the energy taken by Distributor is resold to lighting and power consumers with demands of 50 kW or more.

Single-Point Delivery

The charges under this rate schedule are based upon the supply of service through a single delivery and metering point, and at a single voltage. If service is supplied to Distributor through more than one point of delivery or at different voltages, the supply of service at each delivery and metering point and at each different voltage shall be separately metered and billed under this rate schedule.

Schedule of Terms

SCHEDULE OF TERMS AND CONDITIONS

1. Financial and Accounting Policy. Municipality agrees to be bound by the following statement of financial and accounting policy:

(a) Except as hereinafter provided, Municipality shall administer, operate, and maintain the electric system as a separate department in all respects, shall establish and maintain a separate fund for the revenues from electric operations, and shall not directly or indirectly mingle electric system funds or accounts, or otherwise consolidate or combine the financing of the electric system, with those of any other of its operations. The restrictions of this subsection include, but are not limited to, prohibitions against furnishing, advancing, lending, pledging, or otherwise diverting electric system funds, revenues, credit or property to other operations of Municipality, the purchase or payment of, or providing security for, indebtedness or other obligations applicable to such other operations, and payment of greater than standardized or market prices for property or services from other departments of Municipality. In the interest of efficiency and economy, Municipality may use property and personnel jointly for the electric system and other operations, subject to agreement between Municipality and TVA as to appropriate allocations, based on direction of effort, relative use, or similar standards, of any and all joint investments, salaries and other expenses, funds, or use of property or facilities.

(b) Municipality shall keep the general books of accounts of the electric system according to the Federal Power Commission Uniform System of Accounts. Municipality shall allow the duly authorized agents of TVA to have free access at all reasonable times to all books and records relating to electric system operations. TVA may provide advisory accounting service, in reasonable amount, to help assure the proper setting up and administering of such accounts.

(c) Municipality shall supply TVA not later than August 15 of each year with an annual financial report in such form as may be requested, of electric system transactions for the preceding year ending June 30 and of electric system assets and liabilities as of June 30. Municipality shall furnish promptly to TVA such monthly operating, statistical, and financial statements relating to electric system operations as may reasonably be requested by TVA. In the event of failure to furnish promptly such statements TVA, following written notification to Municipality of intention so to do, may with its own staff perform at Municipality's expense all work necessary to collect such data.

(d) Municipality shall have the electric system financial statements examined annually by independent certified public accountants in accordance with generally accepted auditing standards and shall publish the financial statements, along with the auditor's certificate, in a newspaper of general circulation in the area.

2. Payments in Lieu of Taxes. Municipality may pay or cause to be paid from its electric system revenues for each year beginning July 1 (hereinafter called "fiscal year," the first such fiscal year for purposes hereof being the year beginning July 1, 1969), an amount for payments in lieu of taxes (hereinafter called "tax equivalents") on its electric system and electric operations which, in the judgment of Municipality's governing body after consultation with the supervisory body, shall represent the fair share of the cost of government properly to be borne thereby, subject, however, to the following conditions and limitations:

(a) The total amount so paid as tax equivalents for each fiscal year shall not exceed a maximum equal to the sum of the following:

(1) One and one-half times the weighted average effective tax rates of the respective taxing jurisdictions as of the beginning of each fiscal year, determined as hereinafter provided in this section, multiplied by the net plant values of the electric plant in service and the book values of materials and supplies within the respective taxing jurisdictions in which Municipality's electric system is located as of the beginning of such fiscal year; and

(2) Two and one-half percent of the adjusted net distribution plant value of electric plant in service within the corporate limits of Municipality and of any other city taxing jurisdiction as of the beginning of each fiscal year; and

(3) One and one-half percent of the adjusted net distribution plant value of electric plant in service outside the corporate limits of Municipality and of any other city taxing jurisdictions as of the beginning of each fiscal year.

(b) Notwithstanding the foregoing, until the first fiscal year in which the aforesaid maximum amount for payments in lieu of taxes calculated as provided in subparagraph (a) of this section exceeds the total of (1) and (2) of this subparagraph (b), the maximum total tax equivalent that may be paid for any fiscal year shall not be less than the sum of the following:

(1) The highest total annual amount in lieu of taxes taken or paid from Municipality's electric system funds prior to April 1, 1969, for any one of the three consecutive calendar years ending with calendar year 1968, increased by the same percentage as that by which the net plant value has increased from December 31, 1968, through June 30, 1969; and

(2) The amount by which the result of the calculation of item (1) in subparagraph (a) of this section for such fiscal year exceeds the result of such a calculation for the year ending with June 30, 1969.

Thereafter, such maximum for any fiscal year shall not exceed the aforesaid maximum calculated as provided in subparagraph (a) of this section. All such maximum amounts shall be subject to the conditions and limitations of subparagraphs (c), (d), and (e) of this section.

(c) Such tax equivalent payments shall be made only from current electric system revenues remaining after payment of or making reasonable provision for payment of (i) current operating expenses of the electric system, including without limitation salaries, wages, cost of materials and supplies, cost of power, and insurance; (ii) current payments of interest on electric system indebtedness, and payment of principal thereof, including amortization, reserve and sinking fund payments, when due; and (iii) reasonable reserves for renewals, replacements, and contengencies and for cash working capital.

(d) The total tax equivalent to be paid for each fiscal year shall be in lieu of all State, county, city, and other local taxes or charges on Municipality's electric system and electric operations except as provided in subparagraph (f) of this section. Accordingly, after initial determination of such total tax equivalent to be paid in the absence of any such taxes or charges, such total tax equivalent shall be reduced by the aggregate amount of any taxes or other charges imposed for such fiscal year on Municipality's electric system or electric operations for the benefit of the respective taxing jurisdictions (including Municipality) in which Municipality's electric system is located and in which such electric operations are conducted, whether or not such taxes or other charges were imposed by the respective taxing jurisdictions receiving the benefit thereof. It shall be the responsibility of Municipality to provide for allocation of such total tax equivalent among the taxing jurisdictions in which Municipality's electric system is located in accordance with applicable law or contracts, but any amount so allocated to any such taxing jurisdiction shall be reduced by the aggregate amount of any such tax or other charges imposed for that fiscal year for the benefit of that taxing jurisdiction. Only the respective amounts remaining after the aforesaid allocated amounts have been so reduced shall be actually paid to Municipality and to such other taxing jurisdictions.

(e) The amounts to be paid for each fiscal year to Municipality and to each other taxing jurisdiction, determined in accordance with and subject to the provisions of this section 2, shall be set forth in a resolution adopted by Municipality's governing

body after consultation with the supervisory body, and Municipality's electric system shall pay such amounts to Municipality and the other taxing jurisdictions as provided in said resolution. Such determination shall be made as early in such fiscal year as possible and shall become final at the end of such year; provided, however, that any reductions in such amounts required by subsection (d) above, to the extent not made during such year, shall be made in the succeeding years until the full adjustments are completed.

(f) Notwithstanding anything in the foregoing which might be construed to the contrary, properly authorized retail sales or use taxes on electric power or energy at the same rates applicable generally to sales or use of personal property or services, including natural or artificial gas, coal, and fuel oil as well as electric power or energy, imposed upon the vendees or users thereof by the State, a county, or a city (including Municipality) on a statewide, countywide, or citywide basis, respectively, shall not be considered a tax or charge on Municipality's electric system or its electric operations or properties for purposes of this section 2.

For purposes of this section 2, the following terms shall have the following meanings:

(a) "Electric system" shall mean all tangible and intangible property and resources of every kind and description used or held for use in the purchase, transmission, distribution, and sale, but not the generation, of electric energy.

(b) "Electric operations" shall mean all activities associated with the establishment, development, and administration of an electric system and the business of supplying electricity and associated services to the public, including without limitation the generation, purchase, and sale of electric energy and the purchase, use, and consumption thereof by ultimate consumers.

(c) "Supervisory body" shall mean any board or other agency of Municipality established to supervise the management and operation of its electric system and electric operations, or, in the absence thereof, the governing body of Municipality.

(d) The term "weighted average effective tax rate" of any taxing jurisdiction shall mean the actual ad valorem real property tax rate in effect multiplied by the weighted average ratio of the assessed value to market value of all classes or real property within such taxing jurisdiction. Said weighted average ratio of assessed to market value for any taxing jurisdiction shall be determined by dividing (1) the total actual assessed valuation of all classes of taxable real

property within such jurisdiction, by (2) the total market value of the same classes of taxable real property within the jurisdiction included in (1), calculated from the assessment ratios determined and published by any authorized agency of the State of Tennessee or, in the absence thereof, by the Tennessee Taxpayers Association, or, if such information is unavailable from either of these sources, from the best information available. For purposes of this section 2, the weighted average effective tax rate in effect at the beginning of any fiscal year for any taxing jurisdiction shall be deemed to be the weighted average effective tax rate of such taxing jurisdiction determined as provided in this paragraph for the tax year (calendar year) immediately preceding such fiscal year using the actual property tax rate and assessment ratios of such taxing jurisdiction in effect for such tax year.

(e) "Net plant value" shall mean the depreciated original cost of electric plant in service used and held for use in the transmission and distribution, but not the generation, of electricity as shown on the books of the electric system from time to time.

(f) "Adjusted net distribution plant value" shall mean net plant value less the depreciated original cost of (1) underground plant in service and (2) electric lines and equipment in service designed for operation at voltages in excess of 26,000 volts.

(g) "Electric plant in service" or "plant in service" shall have the meanings defined or ascribed to them in the Federal Power Commission's Uniform System of Accounts.

3. Municipality's Lines and Equipment. All lines and substations from the point or points of delivery (as defined in section 3 of the contract of which these Terms and Conditions are a part), and all electrical equipment, except metering equipment of TVA, located on Municipality's side of such point or points of delivery shall be furnished and maintained by Municipality. Municipality's electrical facilities shall conform to accepted modern standards. Failure to inspect for or to object to defects in such facilities shall not render TVA liable or responsible for any loss or damage resulting therefrom or from violation of the contract of which these Terms and Conditions are a part, or from accidents which may occur upon Municipality's premises.

4. Responsibility for Property of the Other Party. All equipment furnished by each party shall be and remain its property. Each party shall exercise proper care to protect any property of the other on its premises, and shall bear the cost of any necessary repairs or replacements arising from its neglect to exercise such proper care. The authorized employees of each party shall have access at all reasonable times to any of its facilities on the other's premises, for such purposes as reading its meters, and testing, repairing, or replacing its equipment.

5. Measurement of Demand, Energy, and Power Factor. TVA will, at its own expense, install and maintain or cause to be installed and maintained the necessary metering equipment for measuring the maximum demand and the amount of energy furnished Municipality at each point of delivery. If, for economy or convenience, such equipment is located elsewhere than at the point of delivery, the readings shall be adjusted to reflect the quantities delivered at the point of delivery and such adjusted amounts shall be deemed to be the measured amounts for purposes of billing under Wholesale Rate Schedule WS. TVA may also, at its option, provide equipment to determine power factor. Municipality shall permit the use of its housing facilities, ducts and supports for TVA's metering equipment.

Municipality shall have the right at its own expense to install, equip, and maintain check meters in a mutually satisfactory location.

TVA will make periodical tests and inspections of its metering equipment in order to maintain a high standard of accuracy, and will make additional tests or inspections of its metering equipment at the request of Municipality. Municipality shall have the right to have representatives present at tests and meter readings. If any test shows that the metering equipment is accurate within two percent no adjustment of past readings will be made and, if the test was requested by Municipality, the testing charge will be paid by Municipality; all other tests shall be at TVA's expense. In case any test shows the meter reading to be in error more than two percent, a corresponding adjustment shall be made in Municipality's bills for any agreed period of error; in the absence of such agreement, the adjustment shall be limited to the current billing period. Should the metering equipment fail, the deliveries will be estimated by TVA from the best information available.

6. Billing. Payment for power and energy used in any monthly period shall become due fifteen days after TVA's meter reading date or seven days after the date of bill from TVA, whichever is later. To any amount remaining unpaid fifteen days after the due date, there shall be added a charge of one percent and an additional one percent shall be added for each succeeding thirty-day period until the amount is paid in full. Upon failure of Municipality to pay for the power and energy used in any monthly period within sixty days after due date, TVA shall have the right, upon reasonable notice, to discontinue the supply of power and energy and refuse to resume delivery so long as any part thereof remains unpaid. Discontinuance of supply under this section will not relieve Municipality of its liability for the agreed minimum monthly payment during the time the supply of energy is so discontinued. All payments shall be made to TVA at its offices at Chattanooga, Tennessee, or at such other place as TVA may from time to time designate. For purposes of billing, the term "month" in Wholesale Power Rate--Schedule WS and the term "monthly period" in this section are defined as the period from the meter reading time in one month to the meter reading time in the next month; provided, however, that with respect to the determination of demand said period shall begin and end at midnight prior to said meter reading times. Subject to such changes in TVA's meter reading scheduling as it deems necessary, meters shall be read on the same day of each month.

7. Adjustment and Change of Wholesale Rate and Resale Rates. The wholesale rate and resale rates provided in sections 4 and 5 of the contract shall

be subject to adjustment and change from time to time in accordance with this section in order to assure TVA's ability to continue to supply the power requirements of Municipality and TVA's other customers on a financially sound basis with due regard for the primary objectives of the TVA Act, including the objective that power shall be sold at rates as low as feasible, and to assure Municipality's ability to continue to operate on a financially sound basis.

Wholesale power rates and charges shall be sufficient to produce revenue from TVA's wholesale power customers which, together with revenue from its other power customers, will assure TVA's ability each fiscal year to:

(a) meet the requirements of the TVA Act including particularly section 15d(f) thereof which provides in part that:

> The Corporation shall charge rates for power which will produce gross revenues sufficient to provide funds for operation, maintenance, and administration of its power system; payments to States and counties in lieu of taxes; debt service on outstanding bonds, including provision and maintenance of reserve funds and other funds established in connection therewith; payments to the Treasury as a return on the appropriation investment pursuant to subsection (e) hereof; payment to the Treasury of the repayment sums specified in subsection (e) hereof; and such additional margin as the Board may consider desirable for investment in power system assets, retirement of outstanding bonds in advance of maturity, additional reduction of appropriation investment, and other purposes connected with the Corporation's power business, having due regard for the primary objectives of the Act, including the objective that power shall be sold at rates as low as are feasible.

and (b) meet all tests and comply with the provisions of TVA's bond resolutions as from time to time adopted and amended in such a manner as to assure its ability to continue to finance and operate its power program at the lowest feasible cost.

Adjustment. TVA will review with Municipality or its representative, at least 30 days prior to the first day of each of the months of October, January, April, and July pertinent data concerning the current and anticipated conditions and costs affecting TVA's operations and the adequacy of its revenues from both wholesale and other power customers to meet the requirements of the TVA Act and the tests and provisions of its bond resolutions as provided in the second paragraph of this section. At least fifteen days prior to the first day of each of the aforesaid months, TVA will determine what adjustments, if any, are required in the demand and energy charges provided for in the then effective Schedule of Rates and Charges to assure (a) revenues to TVA adequate to meet the requirements of the TVA Act and the tests and provisions of its bond resolutions as provided in the second paragraph of this section and (b) revenues to Municipality adequate to compensate for changes, if any, in the cost of power to Municipality resulting from adjustments to Wholesale Power Rate--Schedule WS made under the provisions of this section. Such adjustments as TVA determines are required shall be incorporated by TVA in Adjustment Addendums to Wholesale Power Rate--Schedule WS and to the resale schedules of the Schedule of

Rates and Charges, which Adjustment Addendums shall be promptly published by TVA by mailing the same to Municipality by registered mail and shall be applicable to bills rendered from meter readings taken for TVA and Municipality billing cycles scheduled to begin on or after the effective date of said Adjustment Addendum; provided that any adjustment determined by TVA to be necessary as hereinbefore provided shall not be conditioned upon or be postponed pending the review provided for in the first sentence of this paragraph or the completion of such review. Municipality shall pay for power and energy in accordance with Wholesale Power Rate--Schedule WS of the Schedule of Rates and Charges as so adjusted from time to time by any such Adjustment Addendums published by TVA as above provided, and shall adjust the charges in the resale schedules of the Schedule of Rates and Charges applicable to its customers in accordance with such Adjustment Addendums and the provisions of such resale schedules.

Change. Whenever any adjustment or adjustments made under the preceding paragraph, or the costs of TVA's service to Municipality and TVA's other customers, or the costs of Municipality's service to customers, or any other factors are believed by either party to warrant general or major changes in the Schedule of Rates and Charges, either party or its representative may request that the parties or their representatives meet and endeavor to reach agreement upon such changes. If within 180 days after any request for such changes the representatives of the parties for any reason have not agreed upon such changes, TVA may thereafter, upon not less than 30 days' notice by registered mail in which the basis for each change is set forth, place into effect such changes in the Schedule of Rates and Charges as it determines will enable TVA to carry out the objectives of the TVA Act and meet the requirements and tests and comply with the provisions of its bond resolutions as outlined in the second paragraph of this section and enable Municipality to continue on a financially sound basis as provided in section 5(c) of the contract and Municipality shall thereafter pay and charge for power and energy in accordance with the Schedule of Rates and Charges as so changed; provided, however, that unless the parties agree otherwise, any adjustment determined by TVA to be required under the provisions of the preceding paragraph of this section shall become effective without reference to, and shall not be delayed or postponed pending completion of, any actions under this paragraph.

8. Compensation for Additional Tax or in Lieu of Tax Payments. It is recognized that among the costs which the rates specified in Wholesale Power Rate--Schedule WS were designed to cover are annual payments in lieu of taxes by TVA in an aggregate sum equivalent to 5 percent of its gross proceeds from sales of power exclusive of sales to agencies of the Government of the United States. If at any time TVA is compelled by law to pay during any fiscal year ending June 30 taxes and payments in lieu of taxes in an aggregate amount which shall exceed 5 percent of such proceeds, TVA may, if it so elects, increase the billing amounts during the succeeding fiscal year by the number of percentage points (to the nearest 0.1 point) by which said aggregate amount exceeded 5 percent of said proceeds.

9. Interference with Availability or Use of Power. Neither TVA nor Municipality shall be liable for damages or breach of contract when and to the extent that the availability or use of power, respectively, is interrupted, curtailed or interfered with or the performance of any other obligation hereunder is prevented by circumstances reasonably beyond the control of the party affected,

15. Conflict. In case of conflict between any express provision of the body of this contract or any provision of the Schedule of Rates and Charges and these Terms and Conditions, the former shall govern.

16. Section Headings. The section headings in this contract are only for convenience of reference and are not a part of the contract between the parties.

Schedule of Rules and Regulations

SCHEDULE OF RULES AND REGULATIONS

1. Application for Service. Each prospective Customer desiring electric service may be required to sign Distributor's standard form of application for service or contract before service is supplied by the Distributor.

2. Deposit. A deposit or suitable guarantee approximately equal to twice the average monthly bill may be required of any Customer before electric service is supplied. Distributor may at its option return deposit to Customer after one year. Upon termination of service, deposit may be applied by Distributor against unpaid bills of Customer, and if any balance remains after such application is made, said balance shall be refunded to Customer.

3. Point of Delivery. The point of delivery is the point, as designated by Distributor, on Customer's premises where current is to be delivered to building or premises. All wiring and equipment beyond this point of delivery shall be provided and maintained by Customer at no expense to Distributor.

4. Customer's Wiring--Standards. All wiring of Customer must conform to Distributor's requirements and accepted modern standards, as exemplified by the requirements of the National Electrical Safety Code and the National Electrical Code.

5. Inspections. Distributor shall have the right, but shall not be obligated, to inspect any installation before electricity is introduced or at any later time, and reserves the right to reject any wiring or appliances not in accordance with Distributor's standards; but such inspection or failure to inspect or reject shall not render Distributor liable or responsible for any loss or damage resulting from defects in the installation, wiring, or appliances, or from violation of Distributor's rules, or from accidents which may occur upon Customer's premises.

6. Underground Service Lines. Customers desiring underground service lines from Distributor's overhead system must bear the excess cost incident thereto. Specifications and terms for such construction will be furnished by Distributor on request

7. Customer's Responsibility for Distributor's Property. All meters, service connections, and other equipment furnished by Distributor shall be, and remain, the property of Distributor. Customer shall provide a space for and exercise proper care to protect the property of Distributor on its premises, and, in the event of loss or damage to Distributor's property arising from neglect of Customer to care for same, the cost of the necessary repairs or replacements shall be paid by Customer.

8. Right of Access. Distributor's identified employees shall have access to Customer's premises at all reasonable times for the purpose of

reading meters, testing, repairing, removing, or exchanging any or all equipment belonging to Distributor.

9. Billing. Bills will be rendered monthly and shall be paid at the office of Distributor or at other locations designated by Distributor. Failure to receive bill will not release Customer from payment obligation. Should bills not be paid as above, Distributor may at any time thereafter, upon five (5) days' written notice to Customer, discontinue service. Bills paid after due date specified on bill may be subject to additional charges. Should the due date of bill fall on a Sunday or holiday, the business day next following the due date will be held as a day of grace for delivery of payment. Remittances received by mail after the due date will not be subject to such additional charges if the incoming envelope bears United States Postal Service date stamp of the due date or any late prior thereto.

10. Discontinuance of Service by Distributor. Distributor may refuse to connect or may discontinue service for the violation of any of its Rules and Regulations, or for violation of any of the provisions of the Schedule of Rates and Charges, or of the application of Customer or contract with Customer. Distributor may discontinue service to Customer for the theft of current or the appearance of current theft devices on the premises of Customer. The discontinuance of service by Distributor for any causes as stated in this rule does not release Customer from his obligation to Distributor for the payment of minimum bills as specified in application of Customer or contract with Customer.

11. Connection, Reconnection, and Disconnection Charges. Distributor may establish and collect standard charges to cover the reasonable average cost, including administration, of connecting or reconnecting service, or disconnecting service as provided above. Higher charges may be established and collected when connections and reconnections are performed after normal office hours, or when special circumstances warrant.

12. Termination of Contract by Customer. Customers who have fulfilled their contract terms and wish to discontinue service must give at least three (3) days' written notice to that effect, unless contract specifies otherwise. Notice to discontinue service prior to expiration of contract term will not relieve Customer from any minimum or guaranteed payment under any contract or rate.

13. Service Charges for Temporary Service. Customers requiring electric service on a temporary basis may be required by Distributor to pay all costs for connection and disconnection incidental to the supplying and removing of service. This rule applies to circuses, carnivals, fairs, temporary construction, and the like.

14. Interruption of Service. Distributor will use reasonable diligence in supplying current, but shall not be liable for breach of contract in the event of, or for loss, injury, or damage to persons or property resulting from, interruptions in service, excessive or inadequate voltage, single-phasing, or otherwise unsatisfactory service, whether or not caused by negligence.

15. Shortage of Electricity. In the event of an emergency or other condition causing a shortage in the amount of electricity for Distributor to meet the demand on its system, Distributor may, by an allocation method deemed equitable by Distributor, fix the amount of electricity to be made available for use by Customer and/or may otherwise restrict the time during which Customer may make use of electricity and the uses which Customer may make of electricity. If such actions become necessary, Customer may request a variance because of unusual circumstances including matters adversely affecting the public health, safety and welfare. If Customer fails to comply with such allocation or restriction, Distributor may take such remedial actions as it deems appropriate under the circumstances including temporarily disconnecting electric service and charging additional amounts because of the excess use of electricity. The provisions of the Section entitled Interruption of Service of this Schedule of Rules and Regulations are applicable to any such allocation or restriction.

16. Voltage Fluctuations Caused by Customer. Electric service must not be used in such a manner as to cause unusual fluctuations or disturbances to Distributor's system. Distributor may require Customer, at his own expense, to install suitable apparatus which will reasonably limit such fluctuations.

17. Additional Load. The service connection, transformers, meters, and equipment supplied by Distributor for each Customer have definite capacity, and no addition to the equipment or load connected thereto will be allowed except by consent of Distributor. Failure to give notice of additions or changes in load, and to obtain Distributor's consent for same, shall render Customer liable for any damage to any of Distributor's lines or equipment caused by the additional or changed installation.

18. Standby and Resale Service. All purchased electric service (other than emergency or standby service) used on the premises of Customer shall be supplied exclusively by Distributor, and Customer shall not, directly or indirectly, sell, sublet, assign, or otherwise dispose of the electric service or any part thereof.

19. Notice of Trouble. Customer shall notify Distributor immediately should the service be unsatisfactory for any reason, or should there be any defects, trouble, or accidents affecting the supply of electricity. Such notices, if verbal, should be confirmed in writing.

20. Non-Standard Service. Customer shall pay the cost of any special installation necessary to meet his peculiar requirements for service at other than standard voltages, or for the supply of closer voltage regulation than required by standard practice.

21. Meter Tests. Distributor will, at its own expense, make periodical tests and inspections of its meters in order to maintain a high standard of accuracy. Distributor will make additional tests or inspections of its meters at the request of Customer. If tests made at Customer's request show that the meter is accurate within two percent (2%), slow or fast, no adjustment will be made in Customer's bill, and Distributor's standard testing

charge will be paid by Customer. In case the test shows meter to be in excess of two percent (2%) fast or slow, an adjustment shall be made in Customer's bill over a period of not over thirty (30) days prior to date of such test, and cost of making test shall be borne by Distributor.

22. Relocation of Outdoor Lighting Facilities. Distributor shall, at the request of Customer, relocate or change existing Distributor-owned equipment. Customer shall reimburse Distributor for such changes at actual cost including appropriate overheads.

23. Billing Adjusted to Standard Periods. The demand charges and the blocks in the energy charges set forth in the rate schedules are based on billing periods of approximately one month. In the case of the first billing of new accounts (temporary service, cotton gins, and other seasonal customers excepted) and final billings of all accounts (temporary service excepted) where the period covered by the billing involves fractions of a month, the demand charges and the blocks of the energy charge will be adjusted to a basis proportionate with the period of time during which service is extended.

24. Scope. This Schedule of Rules and Regulations is a part of all contracts for receiving electric service from Distributor, and applies to all service received from Distributor, whether the service is based upon contract, agreement, signed application, or otherwise. A copy of this schedule, together with a copy of Distributor's Schedule of Rates and Charges, shall be kept open to inspection at the offices of Distributor.

25. Revisions. These Rules and Regulations may be revised, amended, supplemented, or otherwise changed from time to time, without notice. Such changes, when effective, shall have the same force as the present Rules and Regulations.

26. Conflict. In case of conflict between any provision of any rate schedule and the Schedule of Rules and Regulations, the rate schedule shall apply.

Assignment Agreement

ASSIGNMENT AGREEMENT
Among
CITY OF JACKSON, TENNESSEE,
JACKSON ENERGY AUTHORITY,
And
TENNESSEE VALLEY AUTHORITY

Date: November 1, 2001 TV-47356A, Supp. No. 68

THIS AGREEMENT, made and entered into by and among CITY OF JACKSON, TENNESSEE (Municipality), a municipal corporation created and existing under and by virtue of the laws of the State of Tennessee; JACKSON ENERGY AUTHORITY (Assignee), a public corporation created and existing under and by virtue of the laws of the State of Tennessee; and TENNESSEE VALLEY AUTHORITY (TVA), a corporation created and existing under and by virtue of the Tennessee Valley Authority Act of 1933, as amended;

W I T N E S S E T H:

WHEREAS, TVA and Municipality have heretofore entered into Power Contract TV-47356A, dated August 12, 1977, as amended (1977 Contract), and related agreements under which Municipality purchases its entire requirements for electric power and energy from TVA for resale; and

WHEREAS, Assignee is in the process of acquiring and plans to operate the electric utility system of Municipality as provided for by Chapter 55 of the Tennessee Private Acts of 2001 (2001 Act); and

WHEREAS, Municipality has requested TVA's consent to the assignment of the 1977 Contract and related agreements from Municipality to Assignee; and

WHEREAS, TVA is willing to consent to this assignment subject to the terms and conditions set forth below;

NOW, THEREFORE, for and in consideration of the premises and of the mutual agreements set forth below, and subject to the provisions of the Tennessee Valley Authority Act of 1933, as amended, the parties agree as follows:

1. Effective as of the date first above written (Effective Date), Municipality hereby assigns to Assignee the 1977 Contract, including all rights and obligations included therein, and TVA hereby consents to such assignment in accordance with the provisions of section 12 of the 1977 Contract.

2. Municipality hereby also assigns to Assignee (and TVA consents to such assignment) the following agreements, including all rights and obligations included therein:

(a) Industrial Development Contract TV-58454A, dated December 21, 1981.

(b) Letter Agreement TV-71888A, dated July 14, 1987.

(c) Letter Agreement TV- 74673A, dated February 4, 1988.

(d) Letter Agreement TV-75737A, dated August 10, 1988.

(e) Mobile Spare Transformer Program Agreement TV-80220U, dated November 27, 1989.

(f) Power Supply Contract TV-85861U, dated March 1, 1992.

(g) Power Supply Contract TV-98618U, dated May 1, 1995.

(h) Comprehensive Services Program Agreement TV-99211U, dated July 1, 1995.

(i) Purchase Agreement TV-98678U, dated January 1, 1996.

(j) Energy Right Residential Program Agreement 98PCG-227153, dated October 1, 1997.

(k) Direct Load Control Agreement 98PCG-231567, dated October 1, 1997.

(l) Power Supply Contract 01PCG-267209, dated September 1, 2000.

(m) Power Supply Contract 00PCG-266825, dated September 25, 2000.

(n) Power Supply Contract 00PCG-264479, dated April 1, 2000.

(o) Power Supply Contract 01PCG-268921, dated November 1, 2000.

3. Assignee, by virtue of said assignment, becomes bound for the full performance of the 1977 Contract.

4. In the event that Assignee shall cease to exist as addressed by section 25 of the 2001 Act or otherwise, all rights and obligations of Assignee under the 1977 Contract shall become the rights and obligations of Municipality without further action by TVA, Municipality, or Assignee.

5. The 1977 Contract is amended in all respects necessary to make all references to Municipality refer to Assignee except for the references with respect to payments in lieu of taxes in the third sentence of section 1, section 6(a)(4), and section 2 of the Schedule of Terms and Conditions, which shall continue to refer to the City of Jackson.

IN WITNESS WHEREOF, the parties to this agreement have caused it to be executed by their duly authorized representatives, as of the day and year first above written.

CITY OF JACKSON, TENNESSEE

By _____
Title:

JACKSON ENERGY AUTHORITY

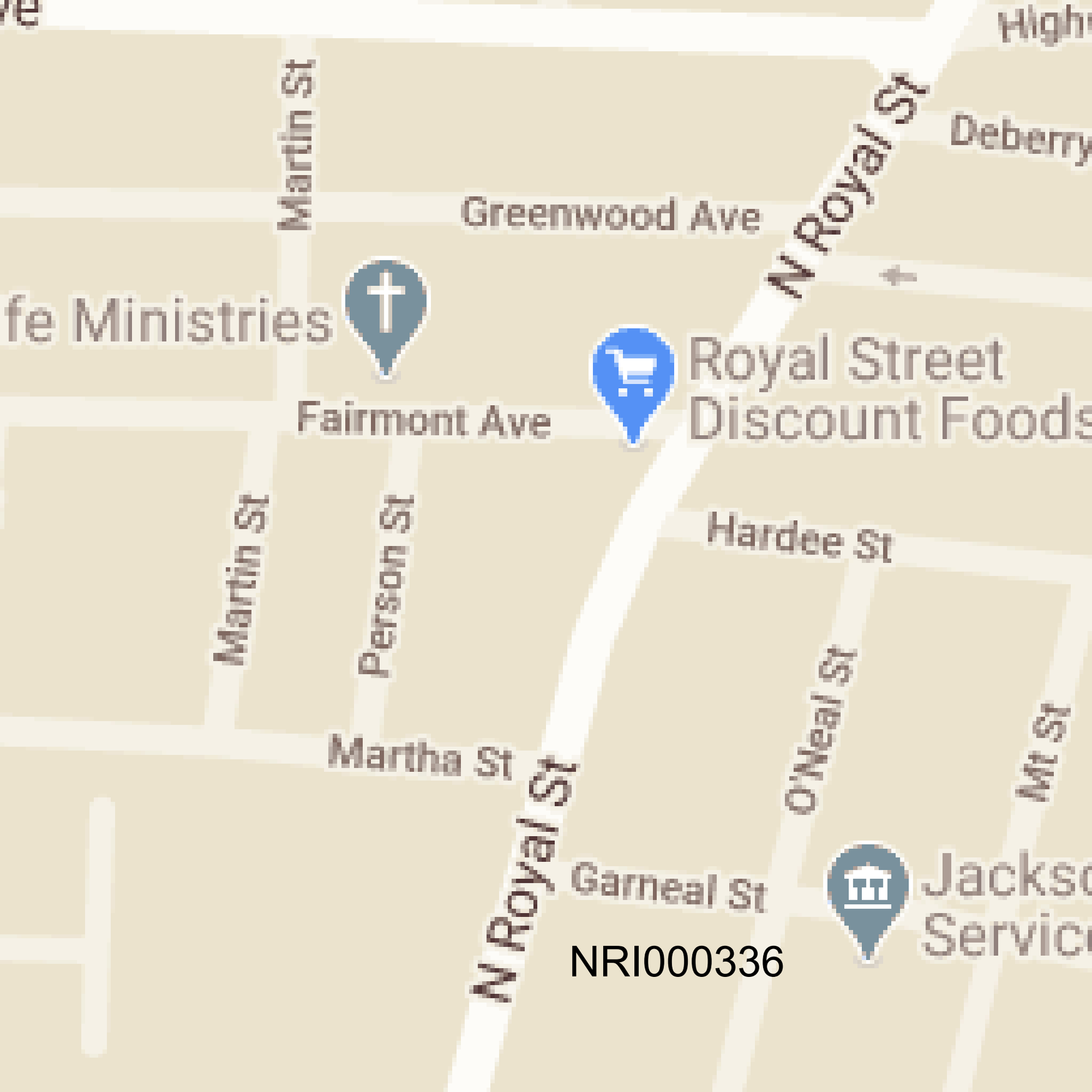
By _____
Title: President

TENNESSEE VALLEY AUTHORITY

By _____
Executive Vice President
Customer Service and Marketing


Jackson Fire Department Station 3
Cupples' J&J
ATM
Ms Em's Custom Draperies
Loving Arms
Carver Ave
Roosevelt Pkwy
Cupples Manufacturing
Whitehall St
Hackberry Ln
Forest Hill Park
Lockwood Dr
Kendall Electric
Google
NRI000334
Map data ©2020


N Royal St
Haughton Alley
Richmond St
NRI000335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Royal Street
Discount Foods
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Hardee St
O'Neal St
Martha St
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Garneal St
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North Pkwy E

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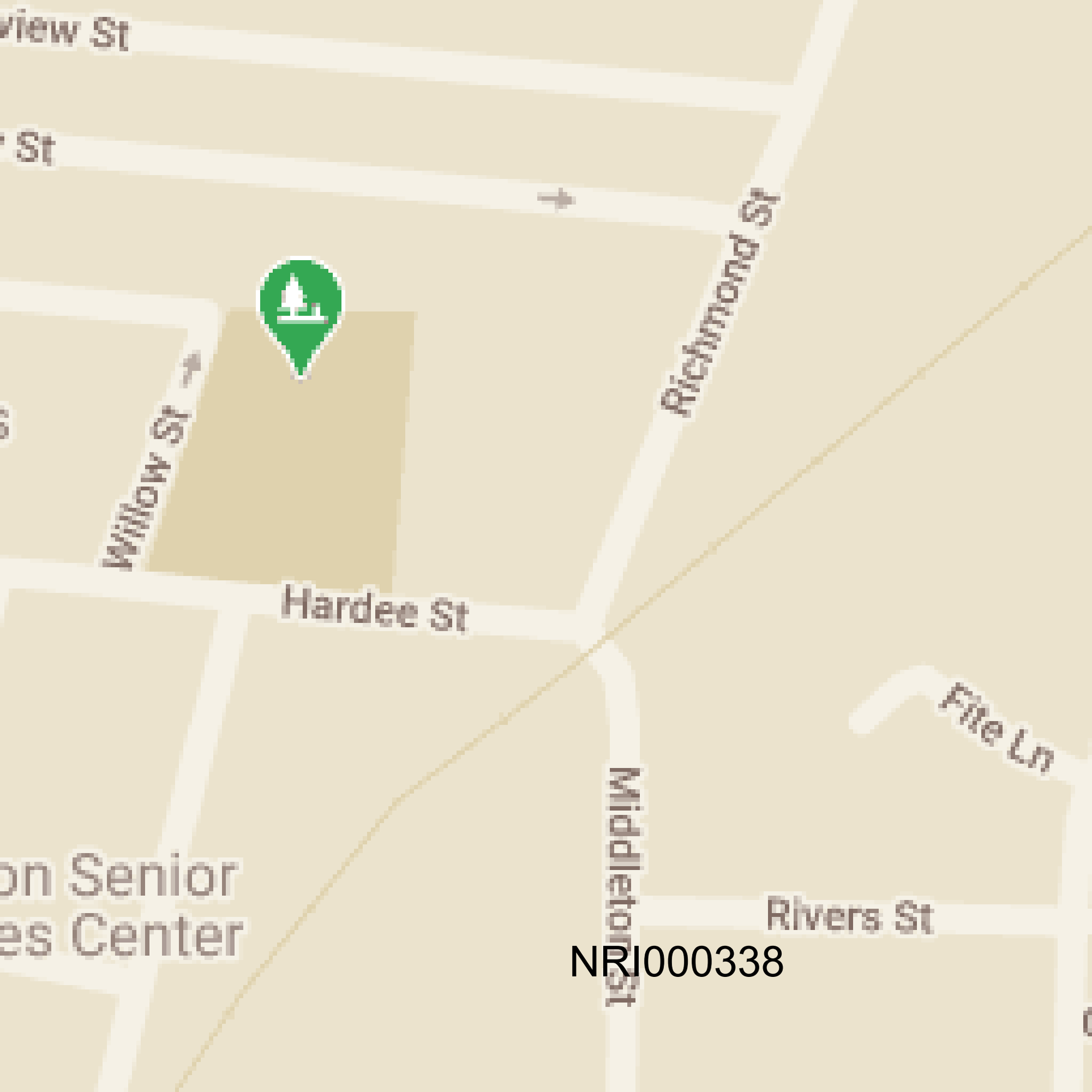
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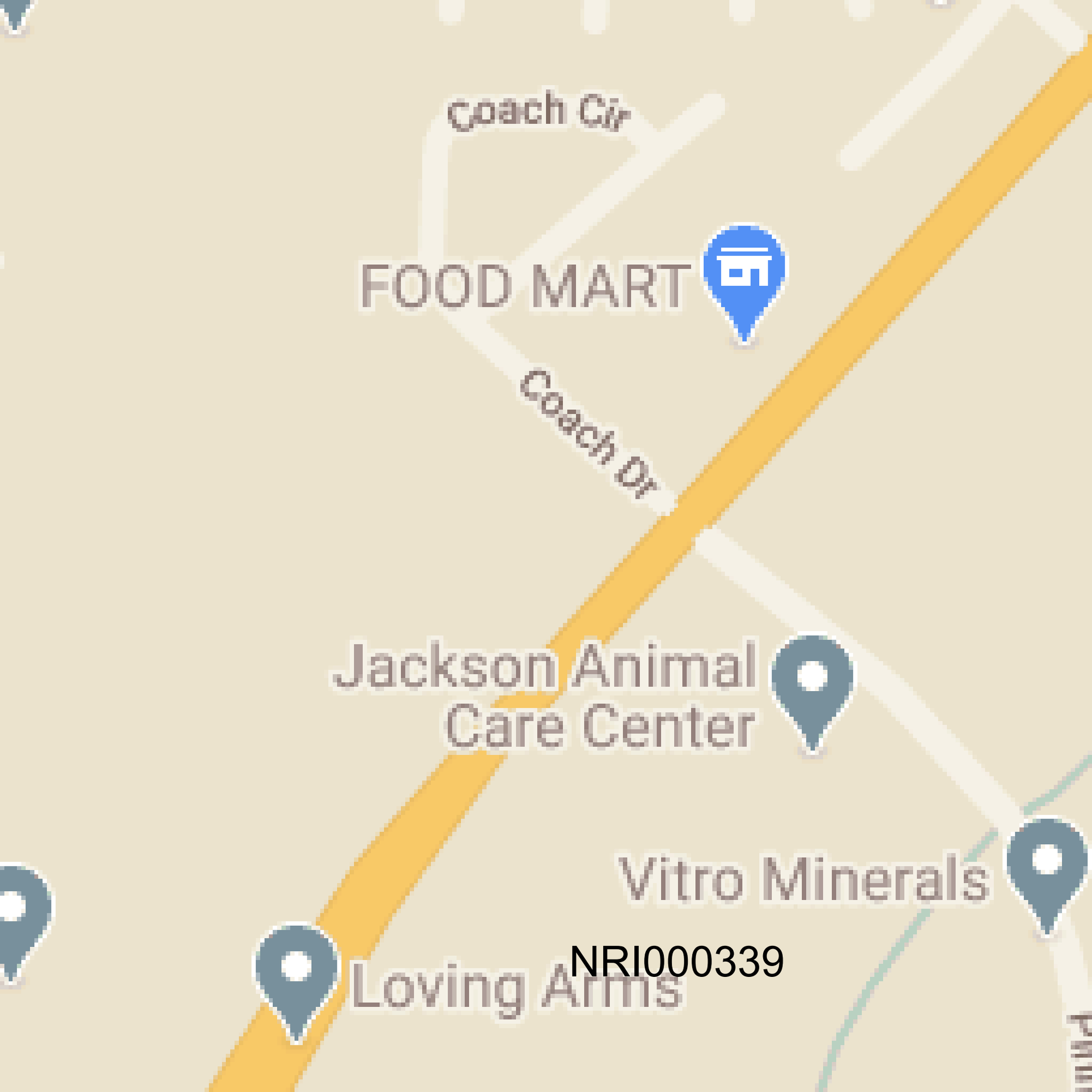
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FOOD MART
Coach Dr
Jackson Animal Care Center
Vitro Minerals
Loving Arms

NRI000339


Machine Tool &
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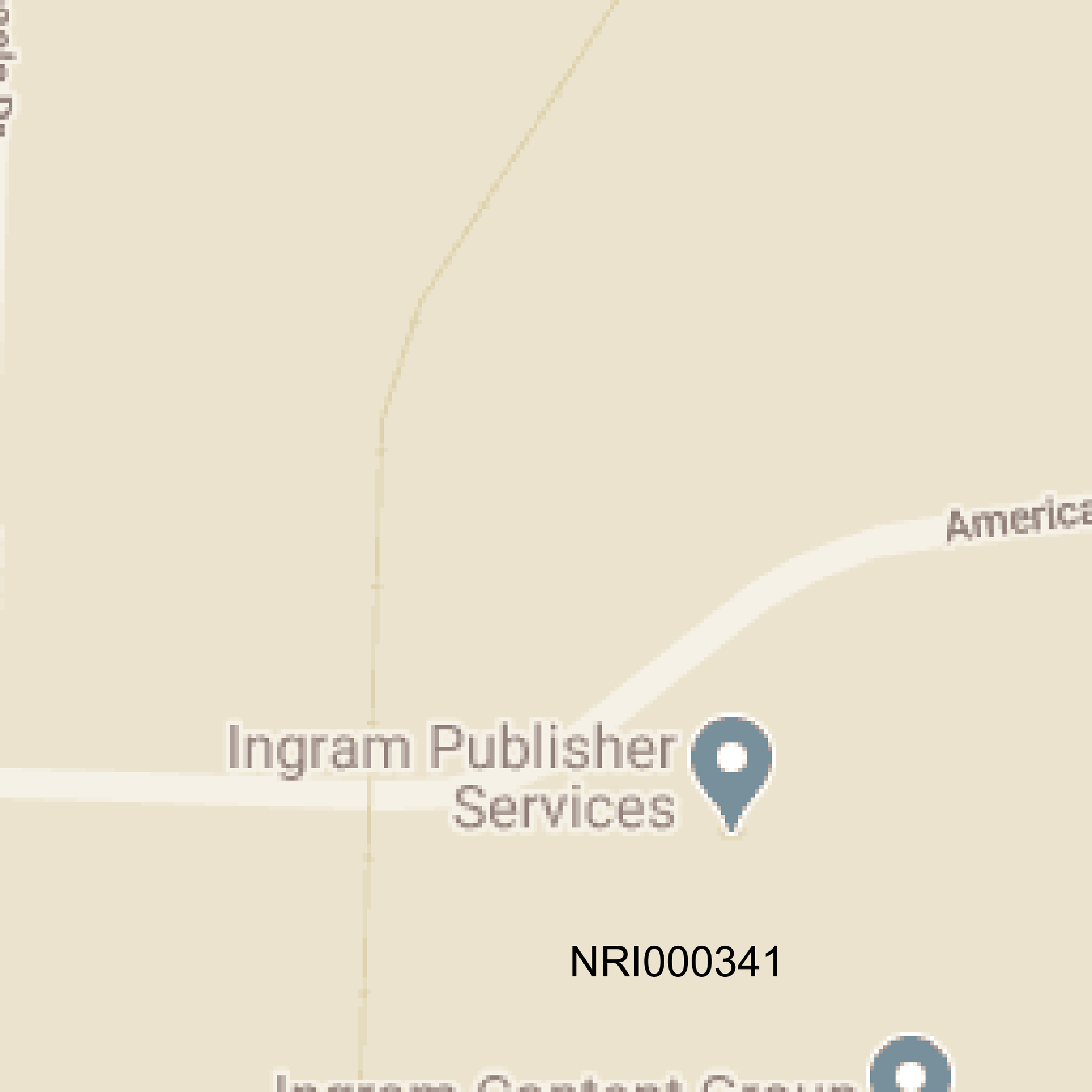
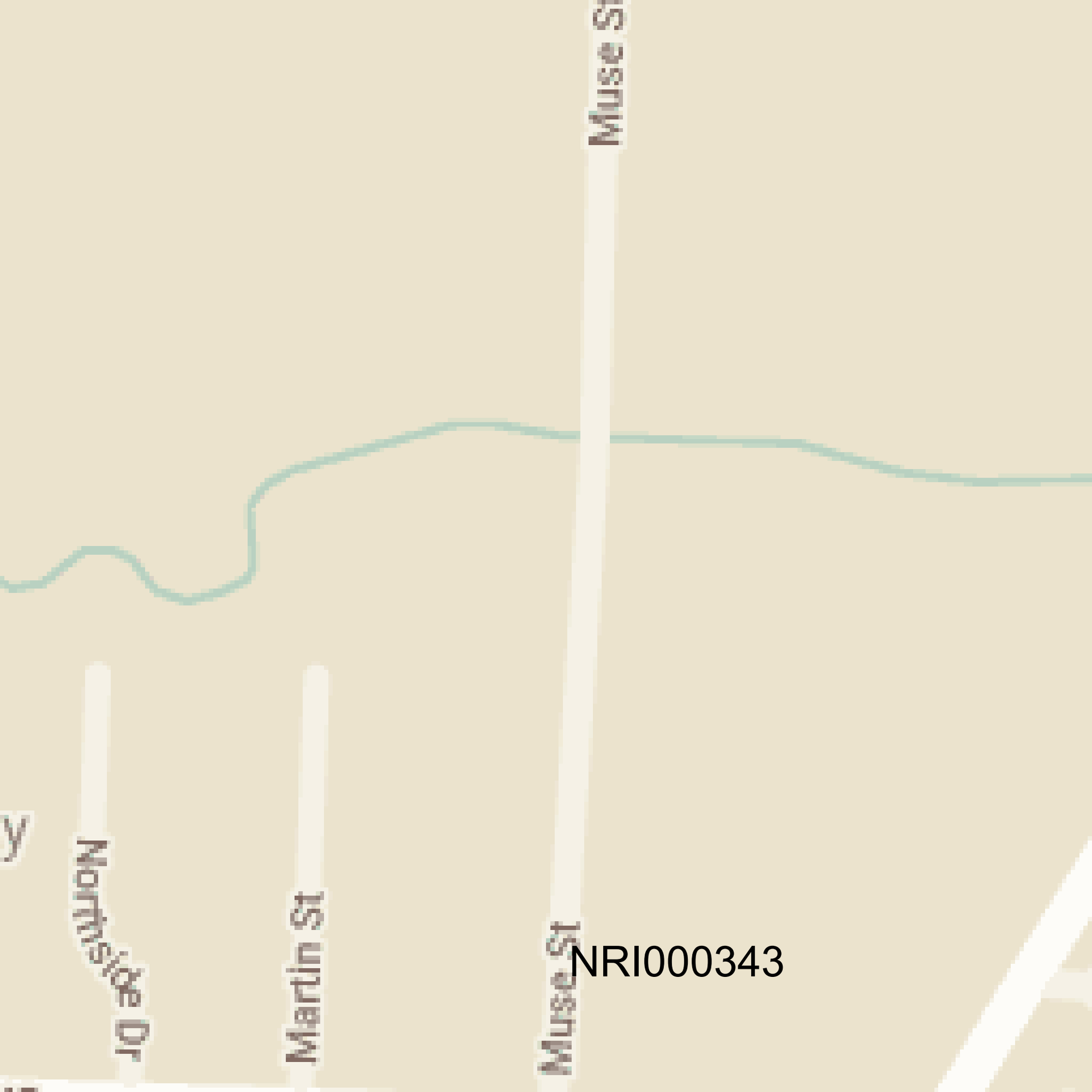
Jackson Fire
Department Station 3
Cupples' J&J
NRI000340



NRI000341


Cupples Manufacturing
Ln
Family Dollar
The Pointe at Boardwalk
Boardwalk Cove
Dr F E Wright
NRI000342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Martin St
Muse St
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Pinnacle Foods Group
NRI000344


Roosevelt Pkwy
Booker St
Lincoln Courts Headstart
Jackson Ho
Authority
Lincoln St
Madison Place
Apartments
Rivers St
NRI000345
Godwin Dr


Draperies
Roosevelt Pkwy
Hackberry
Forest
Hill Park
Lockwood Dr
Alpine Cove
Rich St
Labelle St
Deviney Com

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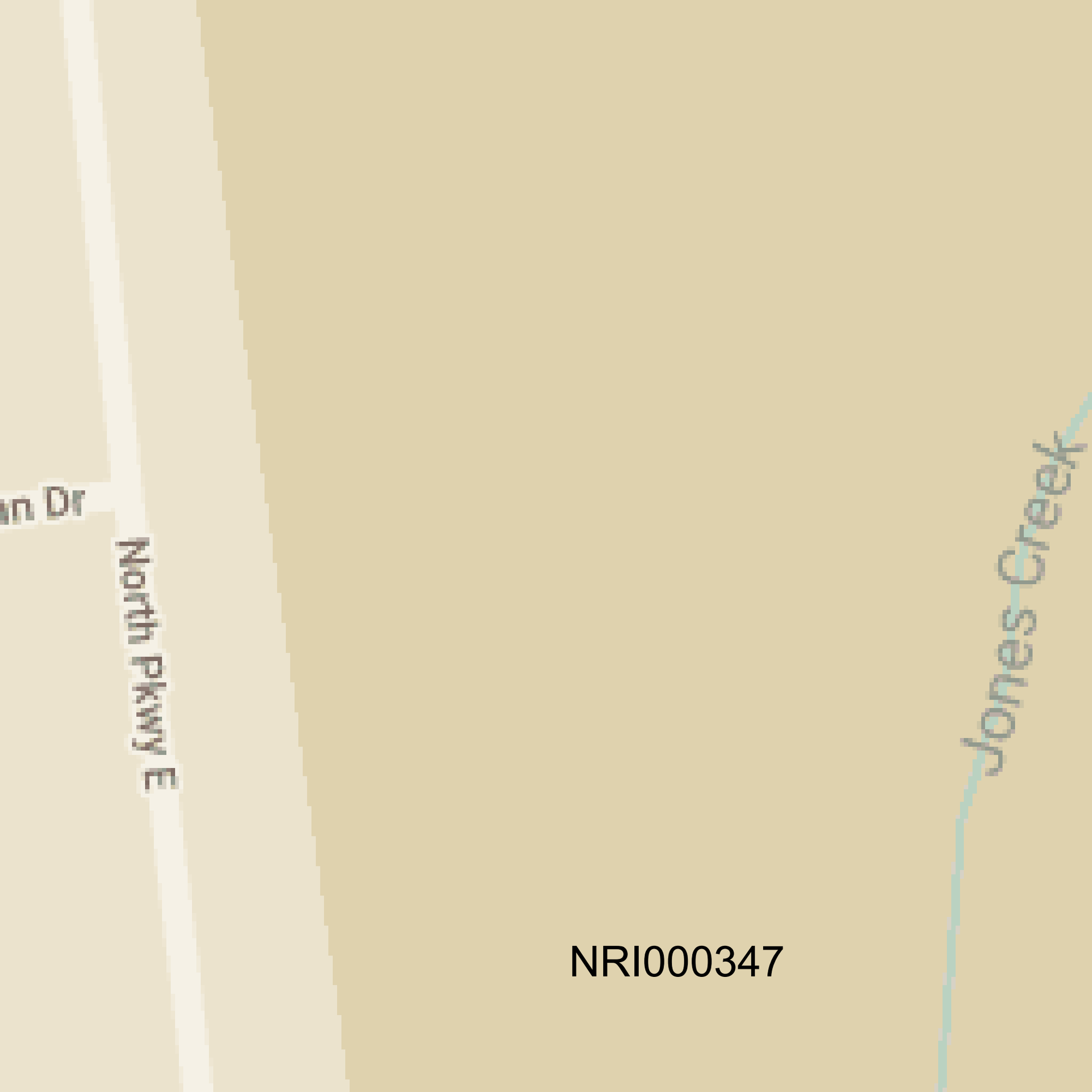
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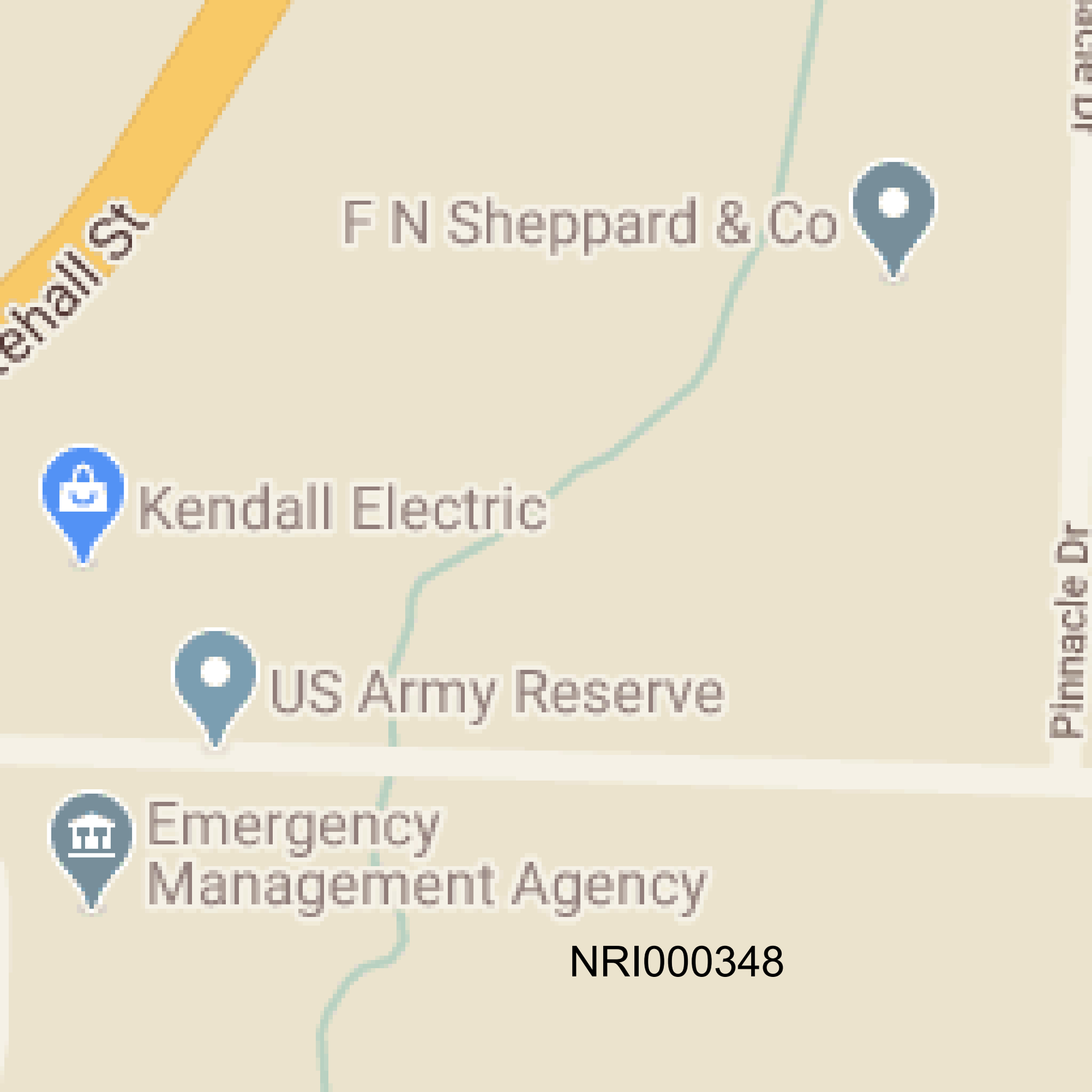
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Kendall Electric
US Army Reserve
Emergency Management Agency
Pinnacle Dr

NRI000348


Sup
Sta
NRI000349
Ms Em's Custom


Carver Cove
Parkway East Apartments
NRI000350
ATM

epcpower
excellence in power conversion

Quote Number	

Customer Information

Company	Project		
Northern Reliability, Inc.	INST0720 - Jackson, TN		
Contact Name	**Contact Phone**		**Contact Email**
Greg Moffroid			gmoffroid@northernreliability.com
Company Street Address	**City**	**State**	**Zip Code**
81 Demeritt Place	Waterbury	VT	05676

Product Types

Inverter	CAB1000	(PD250, PD500, CAB1000)
Cooling		(N/A, cooling kit, other)
Cabinet	outdoor	(indoor, outdoor)

Power Circuit

Power Requirement	Min (kVA)		Max (kVA)	1250
Current Requirement	Max (A)			discharge
DC Voltage	Min (V)	900	Max (V)	1183
DC Source Type	Li ION		(Flow, Li-ion, Lead, other)	
DC Source Manufacturer	Kore Mark 1			
DC Precharge Method	DC Precharge	X		
	AC Precharge			
AC Voltage	Line-Line RMS Voltage	600	Frequency (Hz)	60
AC Voltage Type	3 Phase	X		
	Split Phase			
Circuit Breaker	Interrupt Rating (kAIC)	35		
Grid Connection	Grid Connected		1741 SA Certification Req.	
	Stand-alone	X		
If grid connected, reference defaults			(HECO 14H, CA R21, etc)	
Country of final installation				
Country Specific Certifications Reqd			(IEC, CE, AS4777, etc)	
Protected Bus	Required		(Remote sense needed for Hydra & seamless reconnect)	
	Not Required	X		
Grounding	DC Ungrounded	X	AC Ungrounded	X
	DC- Grounded		AC Y Center Gnd	

	DC Mid Gnd		AC Delta Corner Gnd	

Ground Fault Detection	Not Required	X
	Required	

Software Limits	None		Max kVA	

System Control

Blackstart	Not required	
	Customer Supplied 24V UPS	
	Customer Supplied 120VAC UPS	X
	Customer Supplied 240VAC UPS	

Communication	CAN Bus	X
	Modbus	X
	Modbus TCP	X

CAN Bus to USB Adapter provided by	Customer	X
	EPC	

Aux Power & Cooling System

Aux Voltage	110-120VAC	
	200-250VAC	X
	480VAC	

Aux Voltage Type	Single Phase		Frequency (Hz)	60
	Split Phase			
	Three Phase	X		

Cooling Equipment Provided By	Customer	
	EPC	X

Heat Exchanger Location		(indoor, outdoor, cabinet mounted)
Heat Exchanger Orientation		(horizontal, vertical)

Installation zip code / address	Jackson, TN, 38301

Historical Minimum Temperature near final installation	Min (°C)	-8

Historical Maximum Temperature near final installation	Max (°C)	36

CABINET SECTION ONLY FOR CABINETS PROVIDED BY EPC POWER

CABINET SECTION ONLY FOR CABINETS PROVIDED BY EPC POWER

Cabinet Installation Environment

Location	Indoor		
	Outdoor	X	
Ambient Temperature Range Near Inverter	Min (°C)		Max (°C)

Cabinet Specifications

Enclosure Requirements	Standard pad-mounted		(NEMA 3R, etc)
Maximum Height			
Maximum Weight			
Cabinet accessibility in final installation	Front	10 ft	Four CAB1000's will be connected onto a single Transformer
	Back	10 ft	
	Right	tbd	(when facing front of cabinet)
	Left	tbd	EPC to suggest best arrangement
Lifting hooks provided by	Customer		
	EPC	X	
Warning Labels provided by	Customer		
	EPC	X	
Coolant Liquid Provided By	Customer	X	
	EPC		
If coolant provided by EPC	Ship w/coolant in	**X?**	
If provided by EPC, Coolant Type	Propylene		(propylene, ethylene, other)

Final Part Numbers & Option Codes

	Part Number	Option Codes
Inverter	#REF! #REF!	#REF!
Cooling System	#REF! #REF!	#REF!
Cabinet	#REF! #REF!	#REF!

Additional Notes

Please attach any relevant single line diagrams to provide additional context

Any changes to system requirements as defined above will incur an additional fee and delayed delivery

Form Completed By

Date

Signature

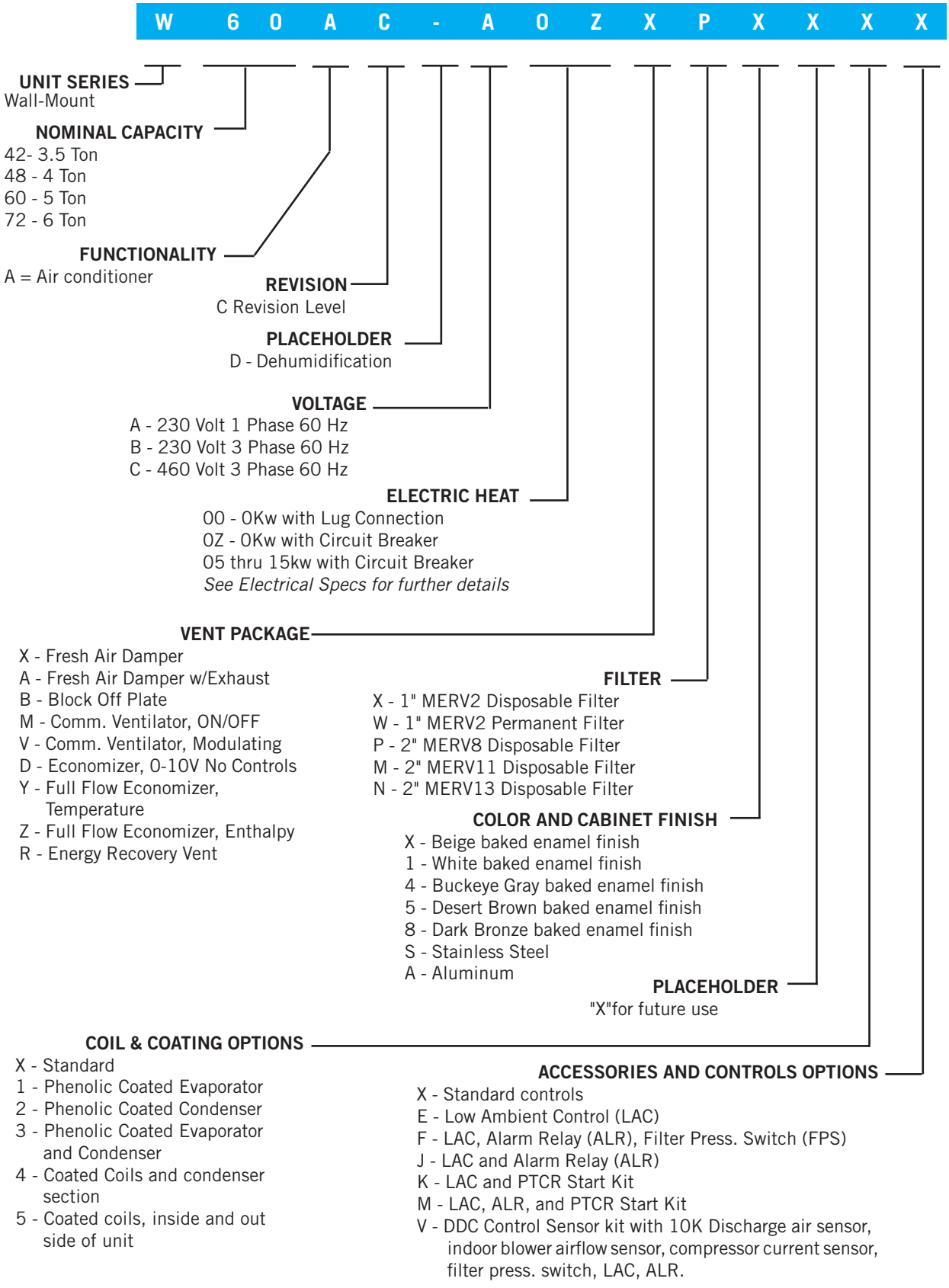
W42AC - W72AC Series 3.5 to 6 Ton 208V to 460V 60hz Air Conditioner Specifications

11EER W42AC-W60AC Series WALL-MOUNT™
10EER W72AC Series WALL-MOUNT™

The Bard Wall-Mount Air Conditioner is an energy efficient self contained system, which is designed to offer maximum indoor comfort at a minimal cost without using valuable indoor floor space or outside ground space. This unit is the ideal product for versatile applications such as: new construction, modular offices, school modernization, telecommunication structures, portable structures, correctional facilities and many more. Factory or field installed accessories are available to meet specific job requirements for your unique application.

- Complies with efficiency requirements of ASHRAE/IESNA 90.1-2016
- Certified to ASNI/ARI Standard 390-2003 for SPVU (Single Package Vertical Units)
- Intertek ETL Listed to Standard for Safety Heating and Cooling Equipment ANSI/UL 1995/CSA 22.2 No. 236-05 Fourth Edition
- Commercial Product - Not intended for residential application
- Bard is an ISO 9001:2015 Certified Manufacturer
- The AHRI Certified® mark indicates Bard Manufacturing Company participation in the AHRI Certification program. For verification of individual certified products, go to www.ahridirectory.org.

/////// WALL-MOUNT NOMENCLATURE



/////// ENGINEERED FEATURES

NEW! EXCLUSIVE *Non-Fiberglass Foil Faced Insulation: Environmentally friendly high "R" value non-fiberglass insulation that is made with recycled denim and cotton materials used with a FSK foil face that is both durable and cleanable.

Durable Cabinet Construction: Multiple cabinet construction options are available for different outdoor conditions. Optional cabinet coatings may be ordered for corrosive outdoor environments. Front access control panel location.

Green Fin Hydrophilic Evaporator Coil: Green fin stock enhances coil wettability to help prevent mold growth, aid with condensate drainage, and provide a limited amount of protection to corrosive particulates in the airstream.

***Balanced Climate™ Technology (patent pending):** High latent capacity humidity & sound reduction removes up to 35% more humidity than any other wall mount on the market with the use of a 2 stage thermostat or controlling device. Bard Balanced Climate™ innovation comes standard on all models.

Optional Mechanical Dehumidification: Models are available with hot gas reheat dehumidification for energy efficient humidity removal. Electronic Expansion Valves are standard for all dehumidification models.

Field or Factory Installed Vents: Multiple ventilation options are available as easily installed kits with electrical plugs, or Factory installed options that can be removed for service. Economizer operation includes improved airpath for minimized recirculation and does not require an intake hood.

Reliable, Easy-to-Use Controls: Easily accessible through front control panel locations. A lockable hinged access cover to circuit protection is provided. Phase rotation monitor is standard on all 3 phase models. Adjustable compressor on/off delay timer (CCM) with diagnostic lights is standard on all models.

ECM Indoor Motor Technology: 5 speed dual shaft motor provides quiet airflow operation when used with a twin blower assembly. Motor overload protection standard on all models.

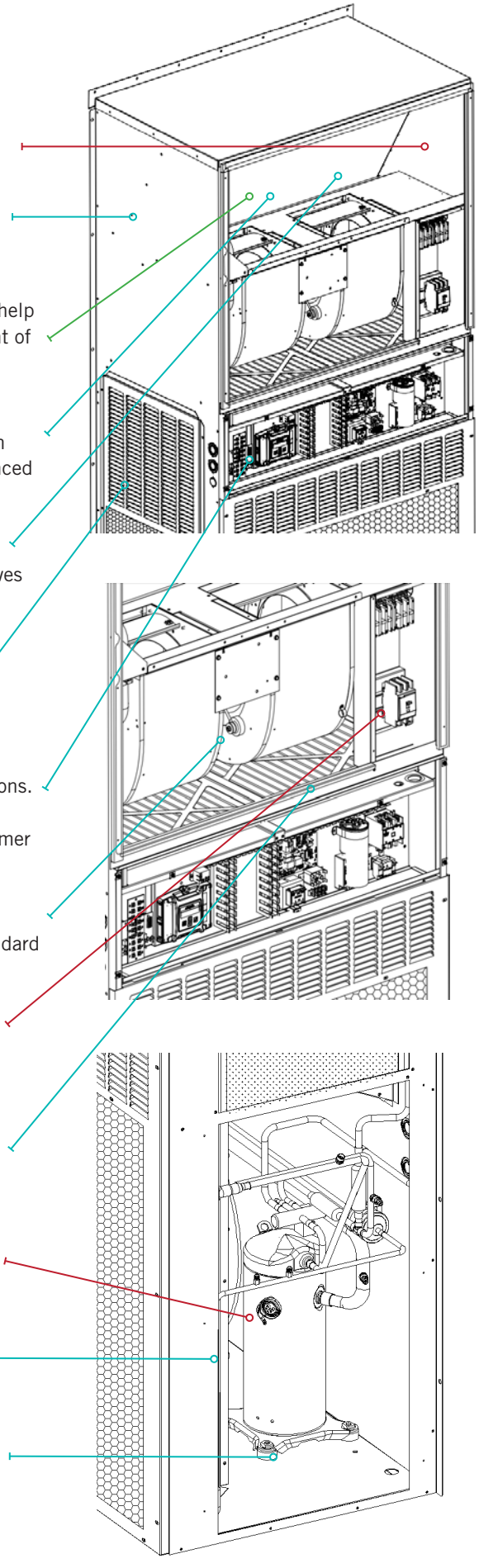
Electric Strip Heat: Reliable, comfortable heater packages feature an automatic limit and thermal cut-off safety control. Heater packages can be factory or field installed.

Easy Filter Access: A separate filter door is provided for ease of filter access during routine unit maintenance. 1" and 2" filters are available with a rating of up to MERV13.

Enclosed Condenser Motor: An enclosed casing condenser motor with ball bearings is used for reliable operation and extended motor life. Enclosed condenser motors are standard on all units.

Improved Condenser Coil Cleaning: Removable fan shroud side panels allow for easy condenser coil intake surface cleaning.

High Efficiency Cooling: Scroll compressors for quiet, efficient cooling. Designed with R-410A (HFC) non-ozone depleting refrigerant in compliance with the Montreal protocol and 2010 EPA requirements. A liquid line filter-drier to protect the system from moisture is standard on all units.



/////// UNIT MODES OF OPERATION

Cooling Operation: The Bard WA Series WALL MOUNT products offer single stage cooling operation using R410A refrigerant. Copper tube/Aluminum hydrophilic green fin coils are used to provide high efficiency and easy serviceability. Scroll compressor technology delivers years of quiet, reliable operation.

Heating Operation: The Bard WA Series WALL MOUNT products offer optional single or two stage heating operation using resistance heaters. Circuit breaker disconnect protection is standard in all units equipped with electric heat.

Mechanical Dehumidification Operation: The Bard W42AC and W72AC Series WALL MOUNT products offer optional dehumidification operation that removes moisture from air entering the unit. A three-way valve, reheat coil, and electronic expansion valve (EEV) are standard with all models. The dehumidification circuit incorporates an independent heat exchanger coil in the supply air stream. This coil reheats the supply air after it passes over the cooling coil without requiring the electric resistance heater to be used for reheat purposes. This results in very high mechanical dehumidification capability from the air conditioner on demand without using electric resistance reheat. Airflow is reduced resulting in quiet and comfortable soft shift to dehum mode.

Ventilation Operation: The Bard WA Series WALL MOUNT products offer optional ventilation operation that brings outdoor air into the structure. Vent options can be factory or field installed, and can be used to bring in outdoor air for occupants, save energy by using outdoor air for free cooling, or positively pressurize a structure. Exhaust air options allow room air to be vented outdoors when fresh air is being brought into the structure. Energy recovery options are also available for occupied structures which condition the air being brought in to save energy when ventilation is necessary regardless of outdoor temperature.

Balanced Climate™ Operation: Balanced Climate™ is a great comfort feature that can easily be applied under any normal circumstances. If you are setting up your Bard system to air condition in a typical environment where 72 degrees is your lowest cooling set-point, then remove the Y1/Y2 jumper, and install a two stage cooling thermostat. You will increase your humidity removal up to 35% and provide a much more comfortable environment.

If you intend air conditioning below 60° outdoor conditions, then just like any other system, a LAC kit must be installed.

If you are installing the unit with any ventilation package , a Bard LAC Kit must be installed. Failure to utilize a LAC with any air conditioner can cause coil freeze up.

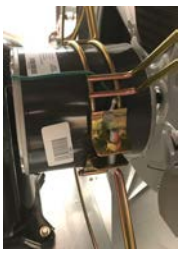
Balanced Climate can readily be applied to Duct-Free (supply & return air grille) applications. It may also be applied to ducted applications with limited static of 0.20" ESP (total including both supply & return statics). Consult Bard Application Engineering for details prior to implementation.

CAUTION: Balanced Climate is not a replacement for a dehumidification (hot gas reheat) unit for extreme applications, but rather an enhancement feature for limited climates and applications.

ADVANCED FEATURE DESCRIPTIONS

ECM Indoor Blower Motor: Energy efficient indoor blower motors use EC constant torque technology with 5 pre-programmed speeds. By selecting the needed speed, the WALL MOUNT product can reduce or increase airflow. A NEMA48® frame enclosure is used. A medium and high speed tap can be user selected to offer the maximum CFM possible with the blower assembly.

- Efficient 5 speed ECM constant torque motor. 24VAC power used for speed selection.
- Fully potted electronic control module for moisture protection.
- 6000V surge protection.
- Dual shaft design with open air over (OAO) enclosure.



Outdoor Fan Motor: Outdoor fan motors use ball bearing construction and are fully enclosed for increased life expectancy.

- Single speed PSC motor.
- Totally enclosed motor housing protects motor windings and internal components from corrosion.
- Ball bearing design reduces motor wear from “windmill” affect when not in operation.

Non Fiberglass Cabinet Insulation: The WALL MOUNT products use advanced non-fiberglass insulation that is made with recycled denim materials. High "R" value, enhanced sound absorption, and reduced delamination are some of the features of this revolutionary product.

- Easy to clean and ramage resistant Foil FSK Facing.
- Fiberglass and Formaldehyde free.
- Meets ASTM E84, UL 723, NFPA 90A and 90B Standards.
- Thermal performance ASTM C518 k=.27@1” & 900gsm

CAPACITY AND EFFICIENCY RATINGS

MODELS	W42AC	W48AC	W60AC	W72AC
Cooling Capacity BTUH ①	42,000	48,000	57,000	71,000
EER ②	11.0	11.0	11.0	10.0

① Capacity is certified in accordance with ANSI/ARI Standard 390-2003.

② EER = Energy Efficiency Ratio and is certified in accordance with ANSI/ARI Standard 390-2003. All ratings based on fresh air intake being 100% closed (no outside air introduction).

SPECIFICATIONS 3-1/2 TON THROUGH 6 TON

MODELS	W42AC-A	W42AC-B	W42AC-C	W48AC-A	W48AC-B	W48AC-C
Electrical Rating – 60 Hz	230/208 - 1	230/208-3	460 - 3	230/208 - 1	230/208 - 3	460 - 3
Operating Voltage Range	197-253	197-253	414-506	197-253	197-253	414-506
Compressor--Circuit A						
Voltage	230/208	230/208	460	230/208	230/208	460
Rated Load Amps	13.8/16.5	9.5/11.3	5.1	16.5/18.7	11.8/13.3	5.8
Branch Circuit Selection Current	19.9	13.6	6.1	21.8	14.5	6.3
Lock Rotor Amps	109/109	83.1/83.1	41	117/117	98/98	55
Compressor Type	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
Fan Motor & Condenser						
Fan Motor--HP--RPM	1/3	1/3	1/3	1/3	1/3	1/3
Fan Motor--Amps	1.9	1.9	1.0	1.6	1.6	1.0
Fan--DIA/CFM	24" - 2900	24" - 2900	24" - 2900	24" - 3000	24" - 3000	24" - 3000
Blower Motor & Evap.						
Blower Motor—HP-SPD	1/2 Variable	1/2 Variable	1/2 Variable	3/4 Variable	3/4 Variable	3/4 Variable
Blower Motor—Amps	1.7	1.7	.9	3.2	3.2	1.6
Motor Type	Constant Torque ECM	Constant Torque ECM	Constant Torque ECM	Constant Torque ECM	Constant Torque ECM	Constant Torque ECM
CFM Cooling & E.S.P. w/Filter (Rated-Wet Coil)	1350-.15	1350-.15	1350-.15	1550-.20	1550-.20	1550-.20
Filter Sizes (inches) STD., 2 required	20x20x1	20x20x1	20x20x1	20x20x1	20x20x1	20x20x1
Basic Unit Weight-LBS.	490	490	490	495	495	495
Barometric Fresh Air Damper (X)	13	13	13	13	13	13
Barometric Damper w/ Exhaust (A)	16	16	16	16	16	16
Blank-Off Plate (B)	14	14	14	14	14	14
Commercial Room Ventilator (M, V)	42	42	42	42	42	42
Economizer (D, Z)	44	44	44	44	44	44
Energy Recovery Ventilator (R)	87	87	87	87	87	87

MODELS	W60AC-A	W60AC-B	W60AC-C	W72AC-A	W72AC-B	W72AC-C
Electrical Rating – 60 Hz	230/208 - 1	230/208 - 3	460 - 3	230/208 - 1	230/208 - 3	460 - 3
Operating Voltage Range	197-253	197-253	414-506	197-253	197-253	414-506
Compressor--Circuit A						
Voltage	230/208	230/208	460	230/208	230/208	460
Rated Load Amps	20.6/23.6	13.6/15.5	7.6	27.4/30.4	16.7/18.5	9.1
Branch Circuit Selection Current	24.4	16	7.8	37	22.5	10.6
Lock Rotor Amps	134/134	110/110	52	185/185	149/149	75
Compressor Type	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
Fan Motor & Condenser						
Fan Motor--HP--RPM	1/3	1/3	1/3	1/2	1/2	1/2
Fan Motor--Amps	1.8	1.8	0.9	3.2	3.2	1.6
Fan--DIA/CFM	24" - 3100	24" - 3100	24" - 3100	24" - 4000	24" - 4000	24" - 4000
Blower Motor & Evap.						
Blower Motor—HP-SPD	3/4 Variable	3/4 Variable	3/4 Variable	3/4 Variable	3/4 Variable	3/4 Variable
Blower Motor—Amps	3.2	3.2	1.6	3.8	3.8	1.9
Motor Type	Constant Torque ECM	Constant Torque ECM	Constant Torque ECM	Constant Torque ECM	Constant Torque ECM	Constant Torque ECM
CFM Cooling & E.S.P. w/Filter (Rated-Wet Coil)	1750-.20	1750-.20	1750-.20	1900-.25	1900-.25	1900-.25
Filter Sizes (inches) STD., 2 required	20x20x1	20x20x1	20x20x1	20x20x1	20x20x1	20x20x1
Basic Unit Weight-LBS.	505	505	505	555	555	555
Barometric Fresh Air Damper (X)	13	13	13	13	13	13
Barometric Damper w/ Exhaust (A)	16	16	16	16	16	16
Blank-Off Plate (B)	14	14	14	14	14	14
Commercial Room Ventilator (M, V)	42	42	42	42	42	42
Economizer (D, Z)	44	44	44	44	44	44
Energy Recovery Ventilator (R)	87	87	87	87	87	87

OPTIONAL SHIPPING CRATES

Optional crates are available to help protect your valuable WALL MOUNT investment during shipping. Constructed from OSB sheathing with steel corner posts, and sized for standard truck transportation. Treated for pests in accordance with the International Plant Protection Convention, Publication 15, Annex 1. Packaging is acceptable for international shipments.

CRATE NO.	UNITS USING CRATE	DESCRIPTION
8620-304	W42A, W48A	Standard Unit Crate
8620-305	W60A, W72A	Standard Unit Crate

COOLING APPLICATION DATA - OUTDOOR TEMPERATURE ①②

MODEL	RETURN AIR (DB/WB)	COOLING CAPACITY	75°F	80°F	85°F	90°F	95°F	100°F	105°F	110°F	115°F	120°F	125°F	131°F
W42	75/62	Total Cooling	44400	42400	40500	38500	36600	34800	33100	31300	29600	27900	26200	24100
		Sensible Cooling	33900	33200	32300	31600	30800	30100	29300	28500	27700	27000	26100	24100
	80/67	Total Cooling	47400	46200	44900	43500	42000	40500	39000	37300	35600	33800	31900	29500
		Sensible Cooling	32900	32500	32000	31600	31100	30600	30000	29400	28800	28200	27500	26700
	85/72	Total Cooling	56500	54000	51600	49100	46700	44300	42100	39700	37400	35100	32800	30000
		Sensible Cooling	33700	33000	32200	31400	30500	29600	28600	27600	26500	25500	24400	23000
W48	75/62	Total Cooling	51300	48800	46500	44100	41800	39700	37500	35300	33300	31200	29200	26700
		Sensible Cooling	40300	39300	38200	37200	36200	35200	34200	33300	32400	31200	29200	26700
	80/67	Total Cooling	54700	53200	51600	49800	48000	46200	44200	42100	40000	37800	35500	32600
		Sensible Cooling	39100	38500	37800	37200	36500	35800	35100	34400	33700	33000	32300	31400
	85/72	Total Cooling	65200	62200	59300	56200	53300	50600	47700	44800	42000	29300	36500	33200
		Sensible Cooling	40100	39100	38000	37000	35800	34700	33500	32300	31100	29800	28600	27100
W60	75/62	Total Cooling	61600	58500	55600	52700	50100	47600	45300	43000	40900	38900	36900	35000
		Sensible Cooling	47200	45800	44400	43100	41900	40900	39800	38900	38000	37200	36500	35000
	80/67	Total Cooling	65700	63700	61700	59600	57500	55500	53400	51300	49200	47100	45000	42800
		Sensible Cooling	45800	44900	44000	43100	42300	41600	40800	40200	39500	38900	38400	37800
	85/72	Total Cooling	78300	74500	70900	67300	63900	60700	57600	54600	51700	48900	46300	43600
		Sensible Cooling	46900	45600	44200	42800	41500	40300	38900	37700	36400	35200	34000	32600
W72	75/62	Total Cooling	76200	72100	68500	65000	61800	58900	56100	53600	51300	49000	47000	44700
		Sensible Cooling	55800	54100	52400	50900	49500	48000	46800	45700	44600	43600	42700	41700
	80/67	Total Cooling	81300	78600	76100	73500	71000	68600	66200	63900	61700	59400	57300	54700
		Sensible Cooling	54100	53000	51900	50900	49900	48900	48000	47200	46400	45600	44900	44100
	85/72	Total Cooling	96800	91900	87400	83000	78600	75000	71400	68000	64800	61700	58900	55700
		Sensible Cooling	55400	53800	52100	50600	49000	47300	48500	44300	42700	41200	39700	38000

① Low ambient control allows for compressor operation down to 0°F.
② Outdoor temperatures shown are measured at the condenser section air inlet.
③ Return air temperature °F.

CAPACITY MULTIPLIER FACTORS			
% of Rated Airflow	-10	Rated	+10
Total BTUH	0.975	1.0	1.02
Sensible BTUH	0.950	1.0	1.05

R410A UNIT CHARGE RATES

UNIT	STD. UNIT - LBS.	DEHUM. UNITS - LBS.
W42AC	7.25	7.25
W48AC	7.38	7.38
W60AC	9.25	9.50
W72AC	9.50	9.75

BALANCED CLIMATE APPLICATION DATA (OPTIONAL, REQUIRES 2 STAGE COOLING THERMOSTAT)

MODEL	RETURN AIR (DB/WB)	COOLING CAPACITY	75°F	80°F	85°F	90°F	95°F	100°F	105°F	110°F	115°F	120°F	125°F
W42	75/62	Total Cooling	40900	39400	37900	36500	34800	33300	31700	30100	28500	26800	25100
		Sensible Cooling	28800	28200	27500	26800	26100	25400	24700	23900	23200	22500	21700
		Latent Cooling	12100	11200	10400	9700	8700	7900	7000	6200	5300	4300	3400
		% Latent Increase	13%	18%	21%	29%	**33%**	**41%**	46%	55%	64%	79%	97%
		Lbs. H2O per Hr.	11.42	10.57	9.811	9.151	8.208	7.453	6.604	5.849	5	4.057	3.208
	80/67	Total Cooling	43600	42900	42100	41200	40000	38800	37400	35900	34300	32500	30600
		Sensible Cooling	27900	27600	27200	26800	26300	25800	25300	24700	24100	23500	22800
		Latent Cooling	15700	15300	14900	14400	13700	13000	12100	11200	10200	9000	7800
		% Latent Increase	8%	10%	13%	17%	20%	24%	26%	29%	33%	38%	44%
		Lbs. H2O per Hr.	14.81	14.43	14.06	13.58	12.92	12.26	11.42	10.57	9.623	8.491	7.358
	85/72	Total Cooling	52000	50200	48400	46500	44500	42500	40300	38200	36100	33800	31500
		Sensible Cooling	28600	28000	27400	26600	25800	25000	24100	23200	22200	21300	20200
		Latent Cooling	23400	22200	21000	19900	18700	17500	16200	15000	13900	12500	11300
		% Latent Increase	3%	5%	8%	11%	13%	16%	17%	19%	22%	23%	26%
		Lbs. H2O per Hr.	22.08	20.94	19.81	18.77	17.64	16.51	15.28	14.15	13.11	11.79	10.66
W48	75/62	Total Cooling	49900	47000	44400	42000	39600	37500	35600	33800	32100	30500	29000
		Sensible Cooling	35200	33900	32700	31500	30400	29500	28600	27700	36900	26200	25500
		Latent Cooling	14700	13100	11700	10500	9200	8000	7000	6100	5200	4300	3500
		% Latent Increase	25%	27%	29%	34%	39%	44%	53%	67%	83%	100%	100%
		Lbs. H2O per Hr.	13.87	12.36	11.04	9.906	8.679	7.547	6.604	5.755	4.906	4.057	3.302
	80/67	Total Cooling	53200	51200	49300	47400	45500	43700	42000	40300	38600	36900	35300
		Sensible Cooling	34100	33200	32400	31500	30700	30000	29300	28600	28000	27400	26800
		Latent Cooling	19100	18000	16900	15900	14800	13700	12700	11700	10600	9500	8500
		% Latent Increase	18%	18%	18%	21%	22%	24%	28%	34%	41%	49%	62%
		Lbs. H2O per Hr.	18.02	16.98	15.94	15	13.96	12.92	11.98	11.04	10	8.962	8.019
	85/72	Total Cooling	63400	59900	56600	53500	50600	47800	45300	42900	40600	38400	36300
		Sensible Cooling	34900	33700	32600	31300	30100	29000	27900	26800	25800	24800	23700
		Latent Cooling	28500	26200	24000	22200	20500	18800	17400	16100	14800	13600	12600
		% Latent Increase	12%	12%	11%	14%	15%	15%	18%	22%	26%	30%	37%
		Lbs. H2O per Hr.	26.89	24.72	22.64	20.94	19.34	17.74	16.42	15.19	13.96	12.83	11.89
W60	75/62	Total Cooling	58100	55200	52400	49900	47500	45300	43300	41400	39600	38000	36500
		Sensible Cooling	40700	39300	38000	36800	35700	34700	33700	32900	32100	31300	30800
		Latent Cooling	17400	15900	14400	13100	11800	10600	9600	8500	7500	6700	5700
		% Latent Increase	17%	20%	22%	27%	**31%**	**37%**	43%	52%	61%	75%	93%
		Lbs. H2O per Hr.	16.42	15	13.58	12.36	11.13	10	9.057	8.019	7.075	6.321	5.377
	80/67	Total Cooling	62000	60100	58200	56400	54500	52800	51100	49400	47700	46100	44500
		Sensible Cooling	39500	38500	37600	36800	36000	35300	346	34000	33400	32800	32400
		Latent Cooling	22500	21600	20600	19600	18500	17500	16500	15400	14300	13300	12100
		% Latent Increase	12%	13%	14%	16%	18%	21%	24%	28%	32%	38%	45%
		Lbs. H2O per Hr.	21.23	20.38	19.43	18.49	17.45	16.51	15.57	14.53	13.49	12.55	11.42
	85/72	Total Cooling	73900	70300	66800	63700	60500	57800	55100	52600	50100	47900	45800
		Sensible Cooling	40500	39100	37800	26600	35300	34200	33000	31900	30800	29600	28700
		Latent Cooling	33400	31200	29000	27100	25200	23600	22100	20700	19300	18300	17100
		% Latent Increase	6%	7%	8%	10%	11%	14%	15%	18%	21%	25%	28%
		Lbs. H2O per Hr.	31.51	29.43	27.36	25.57	23.77	22.26	20.85	19.53	18.21	17.26	16.13
W72	75/62	Total Cooling	70500	67400	64400	61600	58800	56200	53600	51200	48900	46700	44500
		Sensible Cooling	46700	45700	44600	43500	42400	41300	40100	38900	37800	36600	35300
		Latent Cooling	23800	21700	19800	18100	16400	14900	13500	12300	11100	10100	9200
		% Latent Increase	14%	17%	19%	22%	**25%**	**27%**	31%	36%	40%	47%	53%
		Lbs. H2O per Hr.	22.45	20.47	18.68	17.08	15.47	14.06	12.74	11.6	10.47	9.528	8.679
	80/67	Total Cooling	75300	73400	71500	69600	67500	65500	63300	61100	58900	56600	54200
		Sensible Cooling	45300	44800	44200	43500	42800	42000	41100	40200	39300	38300	37200
		Latent Cooling	30000	28600	27300	26100	24700	23500	22200	20900	19600	18300	17000
		% Latent Increase	9%	10%	11%	13%	15%	16%	18%	20%	22%	25%	27%
		Lbs. H2O per Hr.	28.3	26.98	25.75	24.62	23.3	22.17	20.94	19.72	18.49	17.26	16.04
	85/72	Total Cooling	89700	85800	82100	78600	75000	71600	68300	65000	61900	58800	55800
		Sensible Cooling	46400	45500	44400	43200	42000	40600	39200	37700	36200	34600	32900
		Latent Cooling	43300	40300	37700	35400	33000	31000	29100	27300	25700	24200	22900
		% Latent Increase	4%	5%	6%	8%	9%	11%	12%	13%	14%	15%	16%
		Lbs. H2O per Hr.	40.85	38.02	35.57	33.4	31.13	29.25	27.45	25.75	24.25	22.83	21.6

① Low ambient operation disables Balanced Climate Operation.
② Outdoor temperatures shown are measured at the condenser section air inlet.
③ Return air temperature °F.
④ % Latent increase is a comparison to non-Balanced Climate unit operation.

CAPACITY MULTIPLIER FACTORS			
% of Rated Airflow	-10	Rated	+10
Total BTUH	0.975	1.0	1.02
Sensible BTUH	0.950	1.0	1.05

/////// INDOOR AIRFLOW CFM @ STATIC PRESSURES - EC BLOWER CONSTANT TORQUE MOTOR WITH ADJUSTMENT SPEEDS

ESP	W42 BLOWER TAPS - DRY/WET COIL CFM					W48 BLOWER TAPS - DRY/WET COIL CFM				
In H2O	Blower and Vent Only	Balanced Climate	Default LO Cooling and Heating	Optional MED Cooling and Heating	Optional HI Cooling and Heating	Blower and Vent Only	Balanced Climate	Default LO Cooling and Heating	Optional MED Cooling and Heating	Optional HI Cooling and Heating
0"	1510/1495	1345/1190	1510/1495	1740/1650	1815/1750	1795/1685	1370/1305	1795/1685	1895/1850	2000/1920
.1"	1445/1415	1120/1025	1445/1415	1660/1600	1740/1675	1730/1625	1270/1200	1730/1625	1845/1765	1940/1850
.15"	1410/1375	1020/950	1410/1375	1620/1565	1700/1635	1690/1590	1220/1145	1690/1590	1815/1725	1905/1815
.2"	1370/1325	930/875	1370/1325	1580/1530	1660/1600	1655/1555	1165/1095	1655/1555	1785/1685	1870/1780
.3"	1280/1230	775/745	1280/1230	1490/1440	1575/1515	1575/1485	1065/995	1575/1485	1715/1610	1800/1710
.4"	1175/1120	650/625	1175/1120	1400/1330	1490/1430	1485/1405	965/900	1485/1405	1635/1540	1730/1635
.5"	1055/1000	560/525	1055/1000	1310/1205	1400/1345	1390/1325	865/810	1390/1325	1550/1475	1655/1560

ESP	W60 BLOWER TAPS - DRY/WET COIL CFM					W72 BLOWER TAPS - DRY/WET COIL CFM				
In H2O	Blower and Vent Only	Balanced Climate	Default LO Cooling and Heating	Optional MED Cooling and Heating	Optional HI Cooling and Heating	Blower and Vent Only	Balanced Climate	Default LO Cooling and Heating	Optional MED Cooling and Heating	Optional HI Cooling and Heating
0"	1930/1880	1420/1355	1930/1880	2110/2070	2265/2245	2150/2070	1645/1565	2150/2070	2205/2130	2265/2195
.1"	1875/1815	1355/1290	1875/1815	2055/2010	2210/2195	2085/2000	1610/1525	2085/2000	2145/2080	2205/2140
.15"	1845/1785	1320/1255	1845/1785	2025/1975	2185/2170	2055/1965	1585/1495	2055/1965	2120/2055	2180/2110
.2"	1815/1750	1285/1225	1815/1750	1995/1945	2160/2145	2025/1930	1550/1460	2025/1930	2090/2025	2150/2080
.3"	1750/1680	1215/1155	1750/1680	1940/1880	2105/2085	1960/1870	1465/1375	1960/1870	2035/1970	2095/2025
.4"	1685/1610	1140/1080	1685/1610	1880/1815	2050/2025	1905/1810	1355/1265	1905/1810	1980/1910	2045/1965
.5"	1620/1535	1060/1005	1620/1535	1815/1750	1990/1965	1845/1760	1220/1135	1845/1760	1925/1845	1990/1910

Above data is with 1" standard throwaway filter and 1" washable filter.
For Optional 2" pleated filter - reduce ESP by .15 in.
See installation instructions for maximum ESP information on various KW application.

Five factory programmed speed taps (torque settings) are available for the indoor blower motor, and are selected through different unit modes of operation. These modes are energized by 24VAC signals from the low voltage terminal block located inside the control panel by a thermostat or other controlling device.

1. Blower and Ventilation Only Speed is the CFM amount for continuous fan and ventilation without a call for cooling.

2. Balanced Climate Speed is the indoor CFM amount for user selectable Balanced Climate operation and optional Mechanical De humidification. To use Balanced Climate, remove the jumper between Y1 and Y2 on the low voltage terminal strip. A 2 stage cool ing thermostat is then used to control blower airflow stages. Be sure to follow all guidelines provided in the installation manual, and a controls kit that includes a low ambient control (LAC) must be used for Balanced Climate Operation. Balanced Climate can be used for duct free and ducted applications below 0.20"WC ESP total static. Balanced Climate provides increased moisture removal during the cooling cycle, but is not a replacement for optional mechanical dehumidification. Optional mechanical dehu midification provides moisture removal without significantly cooling the space being conditioned. Mechanical dehumidification is highly recommended for applications requiring indoor humidity control for schools, public areas, agricultural, pharmaceutical, and areas with high outdoor humidity and varying indoor heat load.

3. Default LO Cooling and Heating Speed is the indoor CFM amount for cooling operation using the default blower speed tap selec tion. This speed is labeled as LO on the speed selection terminal strip inside the unit control panel. All units ship with cooling and heating operation at LO cooling and heating speed, and provides the optimal airflow amount for normal use.

4. Optional MED Cooling and Heating Speed is selected manually during unit setup and provides a higher indoor CFM for hi static duct applications and increased airflow. This speed is labeled as MED on the speed selection terminal strip inside the unit control panel.

5. Optional HI Cooling and Heating Speed is selected manually during unit setup and provides the highest allowable indoor CFM amount. Not recommended for standard unit operation. This speed is labeled as HI on the speed selection terminal strip inside the unit control panel.

SOUND DATA - DBA @ 5 FT. AND 10 FT.*

DUCT FREE	INDOOR COOLING OPERATION @ 5 FT.				INDOOR COOLING OPERATION @ 10 FT.				OUTDOOR @ 5 FT.
Unit	STD Grilles	With WMSC5	With WMSC5 and WARP-11	WMSC5, WARP-11, WAPFB51	STD Grilles	With WMSC5	With WMSC5 and WARP-11	WMSC5, WARP-11, WAPFB51	STD Features
W42AC	56.1	53.1	51.1	50.3	51.7	50.7	51	49.6	73.7
W48AC	57	49.1	48.6	45.6	52.7	48.7	47.5	47.4	73.6
W60AC	56.5	52	48.4	47.4	53.3	49.7	47.4	46.5	71.4
W72AC	61.2	54	50.8	50.1	56.6	50.2	48	46.2	78.9

DUCTED SUPPLY	INDOOR COOLING OPERATION @ 5 FT.				INDOOR COOLING OPERATION @ 10 FT.				OUTDOOR @ 10 FT.
Unit	STD Grilles	With WMSC5	With WMSC5 and WARP-11	WMSC5, WARP-11, WAPFB51	STD Grilles	With WMSC5	With WMSC5 and WARP-11	WMSC5, WARP-11, WAPFB51	STD Features
W42AC	56.3	53.2	50.4	N/A	51.1	51.4	50.7	N/A	68.6
W48AC	57.8	49.8	46.4	N/A	52.8	49.8	44.7	N/A	69
W60AC	56	47.1	46.6	N/A	52.7	47.1	44.8	N/A	66.8
W72AC	60.8	54.7	49.1	N/A	57.1	48.7	45.1	N/A	77.1

Integrated values calculated per ANSI/ASA S12.60-2009/Part 2, Section 5.2.2.1, Integrated Sound Values are also applicable for use in learning spaces for LEED schools; EQ Prerequisite 3 - Minimum Acoustical Performance, OPTION 1. Using methods prescribed in ANSI S12.60, classroom must achieve a maximum background noise level of 45 dBa. Results referenced were recorded in The Bard Manufacturing Company, Inc. Sound Lab Facility. Actual field application results may vary with the classroom design and construction methods.

ELECTRICAL SPECIFICATIONS — W**AC SERIES

MODEL	Rated Volts & Phase	No. Field Power Circuits	Single Circuit				Multiple Circuit							
			③ Minimum Circuit Ampacity	① Maximum External Fuse or Ckt. Brkr.	② Field Power Wire Size	② Ground Wire	③ Minimum Circuit Ampacity		① Maximum External Fuse or Ckt. Breaker		② Field Power Wire Size		② Ground Wire Size	
							Ckt. A	Ckt. B	Ckt. A	Ckt. B	Ckt. A	Ckt. B	Ckt. A	Ckt. B
W42AC-A00, A0Z	230/208-1	1	31	50	8	10								
A05		1	31	50	8	10								
A10		1	57	60	6	10								
A15		1 or 2	83	90	4	8	57	26	60	30	6	10	10	10
A20		1 or 2	109	125	2	6	57	52	60	60	6	6	10	10
W42AC-B00, B0Z	230/208-3	1	23	35	8	10								
B06		1	23	35	8	10								
B09		1	32	35	8	10								
B15		1	51	60	6	10								
B18		1	60	60	6	10								
W42AC-C00, C0Z	460-3	1	12	15	14	14								
C09		1	17	20	12	12								
C15		1	26	30	10	10								
W48AC-A00, A0Z	230/208-1	1	35	50	8	10								
A05		1	35	50	8	10								
A10		1	59	60	6	10								
A15		1 or 2	85	90	4	8	59	26	60	30			10	10
A20		1 or 2	111	125	2	6	59	52	60	60			10	10
W48AC-B00, B0Z	230/208-3	1	26	35	8	10								
B06		1	26	35	8	10								
B09		1	33	35	8	10								
B15		1	51	60	6	10								
B18		1	60	60	6	10								
W48AC-C00, C0Z	460-3	1	12	15	14	14								
C09		1	17	20	12	12								
C15		1	26	30	10	10								
W60AC-A00, A0Z	230/208-1	1	38	60	8	10								
A05		1	38	60	8	10								
A10		1	59	60	6	10								
A15		1 or 2	85	90	3	8	59	26	60	30	6	10	10	10
A20		1 or 2	111	125	2	6	59	52	60	60	6	6	10	10
W60AC-B00, B0Z	230/208-3	1	28	40	8	10								
B06		1	28	40	8	10								
B09		1	34	40	8	10								
B15		1	52	60	6	10								
B18		1 or 2	61	70	6	8	34	28	40	30	8	10	10	10
W60AC-C00, C0Z	460-3	1	14	20	12	12								
C09		1	18	20	12	12								
C15		1	26	30	10	10								
W72AC-A00, A0Z	230/208-1	1	56	60	6	10								
A05		1	56	60	6	10								
A10		1 or 2	60	70	6	8	56	26	60	30	6	10	10	10
A15		1 or 2	86	90	3	8	56	52	60	60	6	6	10	10
A20		1 or 2	112	125	2	6	56	52	60	60	6	6	10	10
W72AC -B00, B0Z	230/208-3	1	38	45	8	10								
B06		1	38	45	8	10								
B09		1	38	45	8	10								
B15		1	53	60	6	10								
B18		1 or 2	N/A	N/A	N/A	N/A	38	28	40	30			10	10
W72AC-C00, C0Z	460-3	1	18	25	10	10								
C09		1	18	25	10	10								
C15		1	27	30	10	10								

① Maximum size of the time delay fuse or circuit breaker for protection of field wiring conductors.
② Based on 75°C copper wire. All wiring must conform to the National Electrical Code and all local codes.
③ These "Minimum Circuit Ampacity" values are to be used for sizing the field power conductors. Refer to the National Electrical code (latest version), Article 310 for power conductor sizing.

CAUTION: When more than one field power circuit is run through one conduit, the conductors must be derated. Pay special attention to Note 8 of Table 310 regarding Ampacity Adjustment Factors when more than three current carrying conductors are in a raceway.

IMPORTANT: While this electrical data is presented as a guide, it is important to electrically connect properly sized fuses and conductor wires in accordance with the National Electrical Code and all local codes.

ELECTRICAL SPECIFICATIONS — W**AC SERIES

Model	Rated Volts & Phase	No. Field Power Circuits	Single Circuit				Dual Circuit							
			① Minimum Circuit Ampacity	② Maximum External Fuse or Ckt. Brkr.	③ Field Power Wire Size	③ Ground Wire	① Minimum Circuit Ampacity		② Maximum External Fuse or Ckt. Breaker		③ Field Power Wire Size		③ Ground Wire Size	
							Ckt. A	Ckt. B	Ckt. A	Ckt. B	Ckt. A	Ckt. B	Ckt. A	Ckt. B
W42ACDA00,A0Z	230/208-1	1	31	40	8	10								
A05		1	31	40	8	10								
A10		1	57	60	6	10								
A15		1 or 2	83	90	4	8	57	26	60	30	6	10	10	10
W42ACDB00,B0Z	230/208-3	1	23	35	8	10								
B05		1	23	35	8	10								
B09		1	33	35	8	10								
B18		1	60	60	6	10								
W42ACDC00,C0Z	460-3	1	13	15	14	14								
C05		1	13	15	14	14								
C09		1	18	20	12	12								
W48ACDA00,A0Z	230/208-1	1	34	50	8	10								
A05		1	34	50	8	10								
A10		1	59	60	6	10								
A15		1 or 2	85	90	4	8	59	26	60	30	6	10	10	10
W48ACDB00,B0Z	230/208-3	1	25	30	8	10								
B05		1	25	30	8	10								
B09		1	34	40	8	10								
B18		1	60	60	6	10								
W48ACDC00,C0Z	460-3	1	12	15	14	14								
C05		1	12	20	12	12								
C09		1	17	20	10	10								
W60ACDA00,A0Z	230/208-1	1	41	50	8	10								
A05		1	41	50	8	10								
A10		1	59	60	6	10								
W60ACDB00,B0Z	230/208-3	1	28	40	8	10								
B09		1	35	40	8	10								
B15		1	53	60	6	10								
W60ACDC00,C0Z	460-3	1	15	20	12	12								
C09		1	18	20	12	12								
C15		1	27	30	10	10								
W72ACDA00,A0Z	230/208-1	1	56	60	6	10								
A05		1	56	60	6	10								
A10		1	60	60	6	10								
A15		1 or 2	86	90	3	8	59	26	60	30	6	10	10	10
W72ACDB00,B0Z	230/208-3	1	36	45	8	10								
B06		1	36	45	8	10								
B09		1	36	45	8	10								
B15		1	51	60	6	10								
W72ACDC00,C0Z	460-3	1	19	25	10	10								
C09		1	19	25	10	10								
C15		1	27	30	10	10								

① These "Minimum Circuit Ampacity" values are to be used for sizing the field power conductors. Refer to the National Electrical code (latest version), Article 310 for power conductor sizing.

② Maximum size of the time delay fuse or circuit breaker for protection of field wiring conductors.

③ Based on 75°C copper wire. All wiring must conform to the National Electrical Code and all local codes.

Caution: When more than one field power circuit is run through one conduit, the conductors must be derated. Pay special attention to note 8 of Table 310 regarding Ampacity Adjustment Factors when more than three (3) current carrying conductors are in a raceway.

IMPORTANT: While this electrical data is presented as a guide, it is important to electrically connect properly sized fuses and conductor wires in accordance with the National Electrical Code and all local codes.

HEATER PACKAGES - FIELD INSTALLED "C" SERIES UNITS

- Designed for adding Electric Heat to 0 KW Units
- ETL US & Canada Listed
- Circuit Breaker Standard on 230/208V Models
- Toggle Disconnect Standard on 460V Models

Air Conditioner Models	-A00 Models 230/208-1		-B00 Models 230/208-3		-C00 Models 460-3	
	Heater Model #	KW	Heater Model #	KW	Heater Model #	KW
W42AC W48AC	WMCBC-08A	0Z	WMCBC-05B	0Z	WMCBC-06C	0Z
	EHWA48C-A05	5	EHWA42C-B06	6		
	EHWA42C-A10	10	EHWA42CD-B09	9	EHWA48C-C09	9
	EHWA42C-A15	15	EHWA42C-B15	15	EHWA42C-C15	15
	EHWA42C-A20	20	EHWA42C-B18	18		
W60AC	WMCBC-09A	0Z	WMCBC-06B	0Z	WMCBC-06C	0Z
	EHWA42C-A05	05	EHWA60C-B06	6		
	EHWA60C-A10	10	EHWA60C-B09	9	EHWA60C-C09	9
	EHWA60C-A15	15	EHWA60C-B15	15	EHWA60C-C15	15
	EHWA60C-A20	20	EHWA60C-B18	18		
W72AC	WMCBC-09A	0Z	WMCBC-06B	0Z	WMCBC-06C	0Z
	EHWA72C-A05	5	EHWA72C-B06	6		
	EHWA72C-A10	10	EHWA72C-B09	9	EHWA60C-C09	9
	EHWA72C-A15	15	EHWA60C-B15	15	EHWA60C-C15	15
	EHWA72C-A20	20	EHWA48C-B18	18		

ELECTRIC HEAT TABLE - REFER TO ELECTRICAL SPECIFICATIONS FOR AVAILABILITY BY UNIT MODEL

NOMINAL KW	AT 240V (1)				AT 208V (1)				AT 480V (2)			AT 460V (2)		
	KW	1-PH AMPS	3-PH AMPS	BTUH	KW	1-PH AMPS	3-PH AMPS	BTUH	KW	3-PH AMPS	BTUH	KW	3-PH AMPS	BTUH
4.0	4.0	16.7		13,652	3.00	14.4		10,239						
5.0	5.0	20.8	12.5	17,065	3.75	18.0	10.4	12,799						
6.0	6.0		14.4	20,478	4.50		12.5	15,359	6.0	7.2	20,478	5.52	6.9	18,840
8.0	8.0	33.3		27,304	6.00	28.8		20,478						
9.0	9.0		21.7	30,717	6.75		18.7	23,038	9.0	10.8	30,717	8.28	10.4	28,260
10.0	10.0	41.7		34,130	7.50	36.1		25,598						
15.0	15.0	62.5	36.1	51,195	11.25	54.1	31.2	38,396	15.0	18.0	51,195	13.80	17.3	47,099
18.0	18.0		43.3	61,434	13.50		37.5	46,076	18.0	21.7	61,434	16.56	20.8	56,519
20.0	20.0	83.3		68,260	15.00	72.1		51,195						

(1) These electric heaters are available in 230/208V units only.
(2) These electric heaters are available in 480V units only.

C SERIES WALL MOUNT™ VENTILATION OPTION SELECTION CHART

VENT CODE	FIELD INSTALL KIT	UNIT	OPERATION	DESCRIPTION
X	FAD-NE5	W42A, W48A, W60A, W72A	Barometric	Air damper provides slight positive room pressure during blower operation, No room air exhaust.
A	FAD-BE5	W42A, W48A, W60A, W72A	Barometric	Air damper provides slight positive room pressure during blower operation, barometric room air exhaust.
B	BOP5	W42A, W48A, W60A, W72A	No Ventilation	Insulated plates used to seal vent intake and exhaust openings.
M	CRV-F5	W42A, W48A, W60A, W72A	24V On/Off	Vent Provides motorized spring return on/off operation to bring in outdoor air and exhaust room air. No intake hood required.
V	CRV-V5	W42A, W48A, W60A, W72A	24V On/Off, 2-10V	Vent provides motorized spring return modulating or on/off operation to bring in outdoor air and exhaust room air. Minimum and occupied vent blade positions. No intake hood required.
D	ECON-NC5	W42A, W48A, W60A, W72A	2-10V only	Full flow Economizer that uses 2 to 10V signal from a DDC control system or thermostat. No intake hood required.
Y	ECON-DB5	W42A, W48A, W60A, W72A	JADE Controller	Full flow economizer that uses the JADE controller and included sensors to operate free cooling. Temperature only operation. No intake hood required.
Z	ECON-WD5	W42A, W48A, W60A, W72A	JADE Controller	Full flow Economizer that uses the JADE controller and included sensors to operate free cooling. Enthalpy operation. No intake hood required.
R	ERV-FA5	W42A, W48A, W60A, W72A	24V On/Off, 3 blower speeds	208/230V Energy Recovery ventilator with energy wheel media. 3 independently selected intake and exhaust blower speeds. No intake hood required.
	ERV-FC5	W42A, W48A, W60A, W72A	24V On/Off, 3 blower speeds	460V Energy recovery ventilator with energy wheel media. 3 independently selected intake and exhaust blower speeds. No intake hood required.

/////// WALL MOUNT™ VENTILATION OPTIONS SPECIFICATIONS

"X" Vent Code Option – Standard Fresh Air Damper No Exhaust (FAD-NE)
The barometric fresh air damper without exhaust is a standard feature on all models. It is installed on the right side above the condenser intake and allows outside ventilation air, up to 25% of the total airflow rating of the unit, to be introduced through the air inlet openings and to be mixed with the conditioned air. The damper opens during blower operation and closes when the blower is off. Adjustable blade stops allow different amounts of outside air to be introduced into the building and can be easily locked closed if required. The room exhaust air path is sealed with an insulated block-off plate.

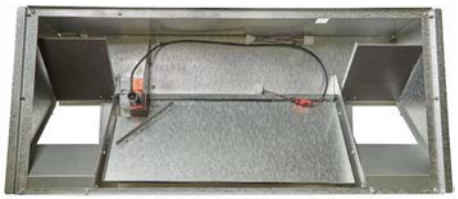
Fresh Air Damper Intake (FAD-NE and FAD-BE)

"A" Vent Code Option – Fresh Air Damper with Barometric Exhaust (FAD-BE)
The barometric fresh air damper with exhaust is an optional feature on all models. It is installed on the right unit side above the condenser intake and allows outside ventilation air, up to 25% of the total airflow rating of the unit, to be introduced through the air inlet openings and to be mixed with the conditioned air. The damper opens during blower operation and closes when the blower is off. Adjustable blade stops allow different amounts of outside air to be introduced into the building and can be easily locked closed if required. The room exhaust air path uses a barometric damper design that relieves room pressurization during outdoor air intake. The damper is located in the front of the unit below the control panel. Adjustable blade stops allow room pressure adjustment by controlling the amount of exhaust air leaving the building.

Fresh Air Damper Exhaust (FAD-BE only)

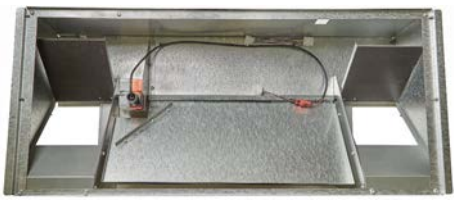
"B" Vent Code Option – Block Off Plate (BOP)
Blank off plates are installed on the inside of the service door and over the exhaust opening in the condenser partition. The plates cover the air inlet and room exhaust openings, which restricts any outside air from entering the unit or room air from leaving the conditioned space. The blank off plate option may be utilized in applications where outside air intake is not required by state or local codes.

"M" Vent Code Option – Commercial Room Ventilator with fixed blade position (CRV-F)
The built-in commercial room ventilator with fixed blade position is internally mounted behind the service door and allows outside ventilation air, up to 50% of the total airflow rating of the unit. It includes a built-in exhaust air damper for room pressurization relief. Blade stops are easily adjustable to set intake airflow. The commercial room ventilator with fixed blade position (CRV-F) is a simple and innovative approach to improving the indoor air quality by providing fresh air intake and exhaust capability. The CRV-F can be activated by indoor blower operation or independently controlled by a thermostat or controller using a 24VAC occupancy or schedule signal. Blade operation is controlled by a on/off spring return motor that closes rapidly when de-energized. Blade seals provide minimal blade leakage.

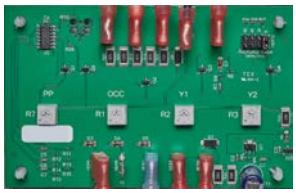


Commercial Room Ventilator-Fixed

"V" Vent Code Option – Commercial Room Ventilator with Modulating Blade position (CRV-V)
The built-in commercial room ventilator with modulating blade position is internally mounted behind the service door and allows outside ventilation air, up to 50% of the total airflow rating of the unit. It includes a built-in exhaust air damper for room pressurization relief. Blade seals allow for minimal blade leakage. A ventilation control board allows multiple blade settings to adjust intake airflow. By setting multiple blade positions, pre-purge, occupied, and unoccupied airflow amounts are possible with capable thermostats and controllers. The CRV-V also allows for 0-10V input for modulating ventilation control based on CO2 levels. Complies with ANSI/ASHRAE Standard 62.1 "Ventilation for Acceptable Indoor Air Quality" and other state and local ventilation codes that require outdoor air intake but not economizer operation.



Commercial Room Ventilator- Modulating



"V" Vent Control Board

"D" Vent Code Option – Economizer without controls installed (ECON-NC)

The built-in economizer is internally mounted behind the service door and allows outside ventilation air, up to 100% of the total airflow rating of the unit. It includes a built-in exhaust air damper for room pressurization relief. The economizer is designed to provide "free cooling" when outside air conditions are cool and dry enough to satisfy cooling requirements without running the compressor. This provides lower operating costs, extended equipment life, and cooling operation at cold (-40°F) outdoor temperatures. The ECON-NC does not contain unit ventilation controls, and provides a 0-10V Belimo actuator motor with spring return. Blade seals are used to minimize blade leakage. Controls are provided by using a field supplied DDC system, or a thermostat capable of 0-10V economizer operation. Indoor and outdoor temperature sensors are not provided with the ventilation option, and must be ordered separately.

Economizer, No Controls

"Y and Z" Vent Code Option – Economizers with JADE® Controller (ECON-WD5 and ECON-DB5)

The JADE controlled economizer is internally mounted behind the service door and allows outside ventilation air. The ECON-WD and ECON-WB allows up to 100% of the total airflow rating of the unit. It includes a built-in exhaust air damper for room pressurization relief. The economizer is designed to provide "free cooling" when outside air conditions are cool and dry enough to satisfy cooling requirements without running the compressor. This provides lower operating costs, extended equipment life, and cooling operation down to -40°F outdoor temperatures.

Economizer, Jade Control

"Y and Z" Vent Code Option – (ECON-WD and ECON-WB) JADE® Controller Information

JADE Economizer controls provide Demand Ventilation Control, operational checkout, an easy to read LCD screen, configurable freeze protection, and LCD displayed economizer component failure alarms. Minimum vent position, occupancy ventilation, and 0-10V CO2 input is available for use with select CO2 room sensors. Economizer operation can be controlled by outdoor dry bulb or outdoor enthalpy measurement. When used with a Bard economizer assembly, the JADE controller is able to meet most state and local codes for economizer use.

Jade Control Module

JADE Controller Specifications:

- Operating Humidity Range (% RH) 5 to 95% RH, non-condensing
- Contact Ratings 30 VAC-- 1.5 A Run, 3.5 A Inrush
- Voltage 20 to 30 VAC RMS
- Operating Temperature Range (F) -40 F to +150 F
- Operating Temperature Range (C) -40 C to +65 C
- Approvals, Federal Communications Commission Compliant
- Approvals, CE Compliant
- Complies with California Title 24
- Mixed air and Outdoor Enthalpy Sensor using Sylk Bus.
- Output 2-10 VDC to actuator, Sylk Bus.

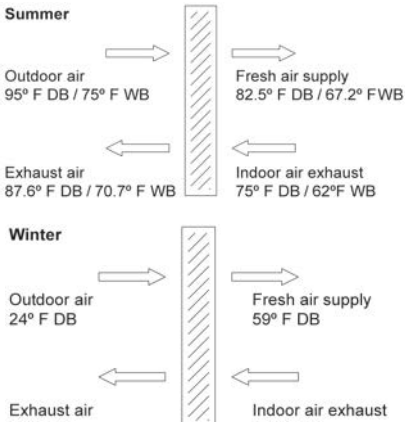
"R" Vent Code Option – Energy Recovery Ventilator (ERV-F)

The wall-mount energy recovery ventilator (ERV) is a highly innovative approach to meeting indoor air quality ventilation requirements as established by ANSI/ASHRAE Standard 62.1. The ERV allows up to 400 CFM (depending upon model) of fresh air and exhaust through the unit while maintaining superior indoor comfort and humidity levels. In most cases this can be accomplished without increasing equipment sizing or operating costs. Heat transfer efficiency is up to 67% during summer and 75% during winter conditions.

The ERV consists of a unique "rotary energy recovery cassette" that provides effective sensible and latent heat transfer capabilities during summer and winter conditions. Various control schemes are addressed including limiting ventilation during building occupancy only. Outdoor air enters the front of the unit below the control panel. Room air is exhausted through the condenser partition into the condenser area. Intake and exhaust use independent blowers for intake air and exhaust air balancing. Each blower assembly has 3 speed taps for blower CFM adjustment. It can be built-in at the factory or field installed as an option. Wiring includes plug-in harnesses for easy vent installation and removal.

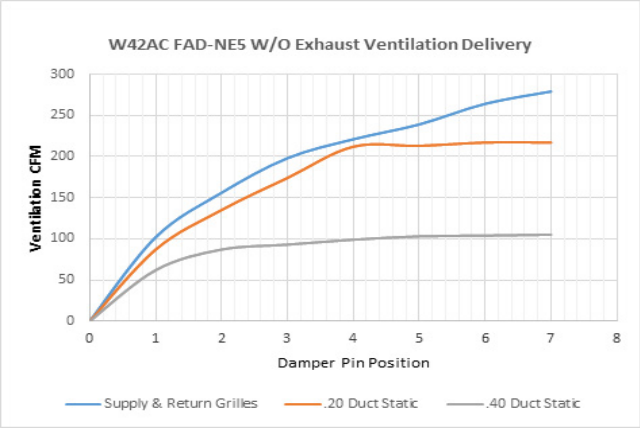
Energy Recovery Ventilator

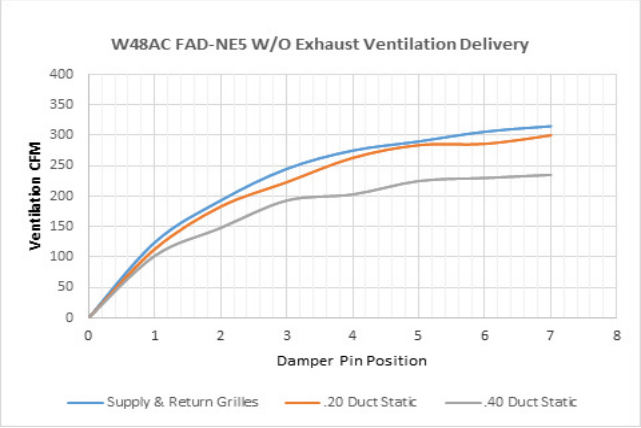
Typical load reductions for ERV-F3

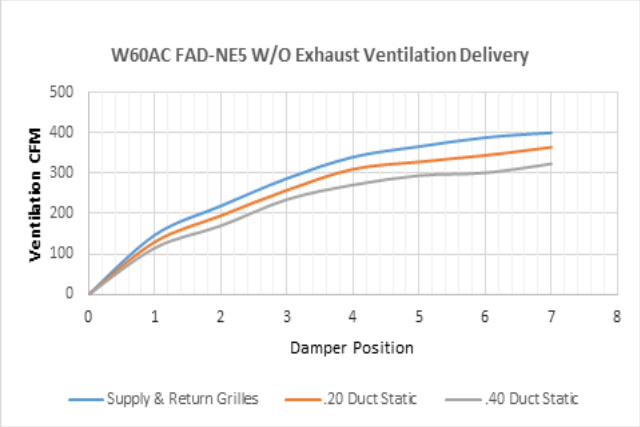


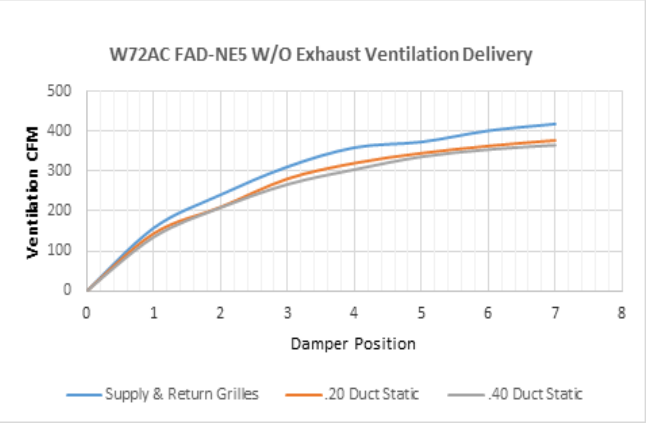
////// WALL MOUNT™ BAROMETRIC DAMPER (FAD) PERFORMANCE

"X" (FAD-NE5 and FAD-NE5) Barometric Damper Without Exhaust Vent Code Options

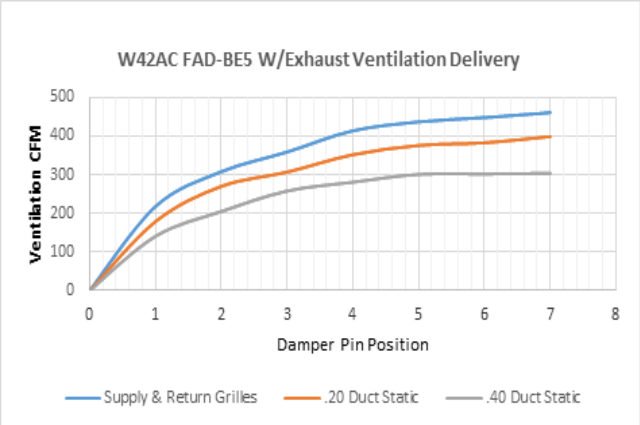


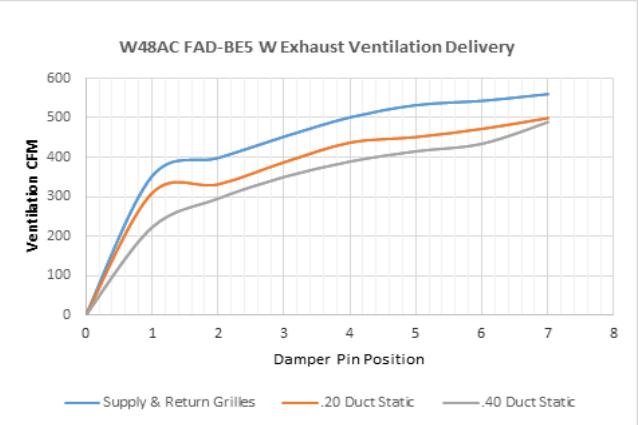


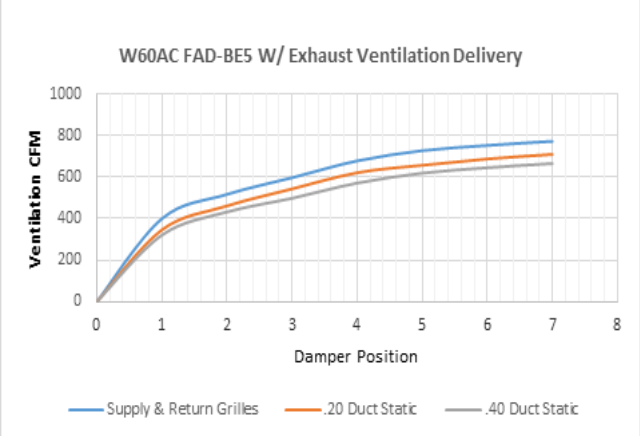


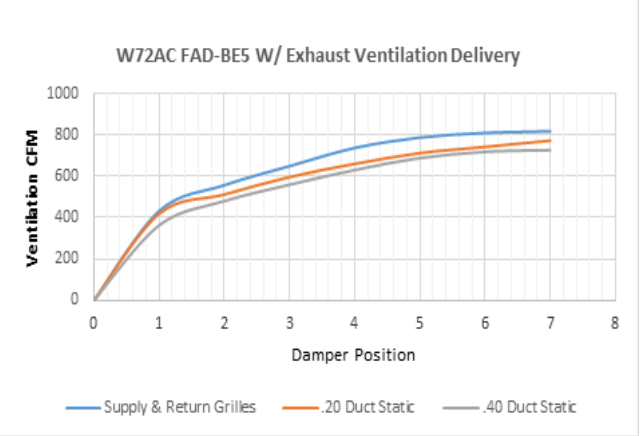


"A" (FAD-BE5 and FAD-BE5) Barometric Damper With Exhaust Vent Code Options



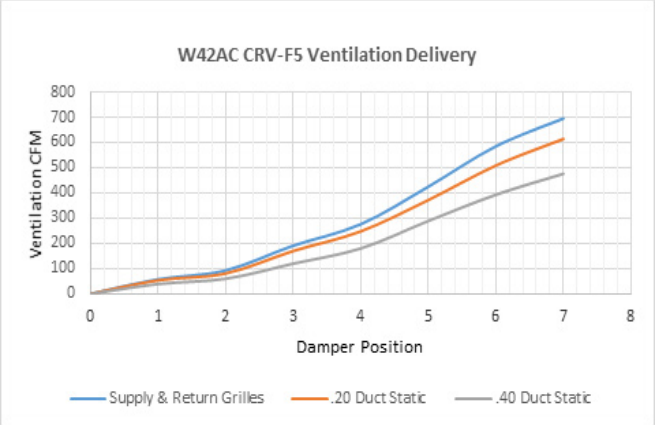


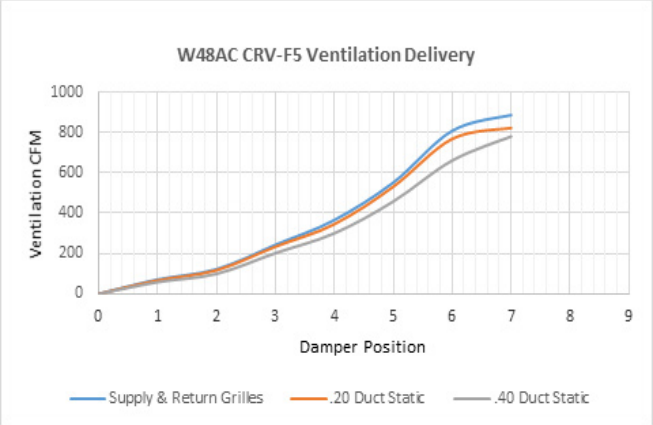


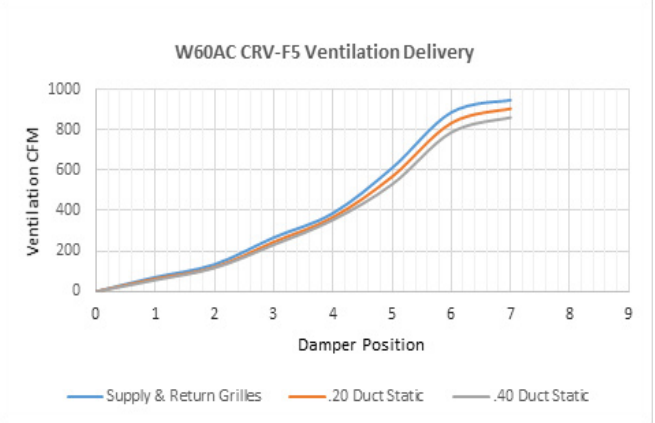


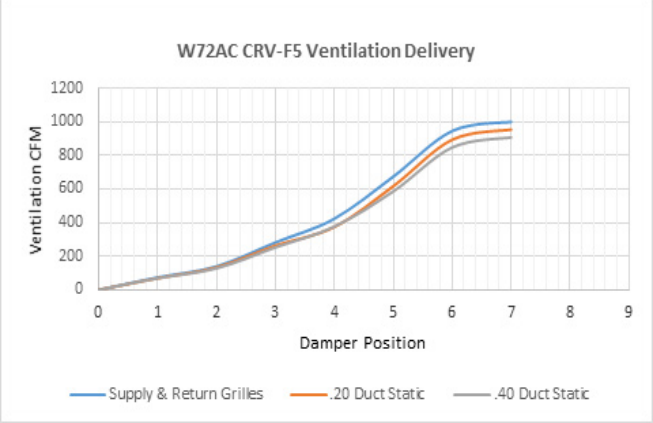
////// WALL MOUNT™ VENTILATION AIRFLOW CHARTS

"M" (CRV-F) Vent Code Options

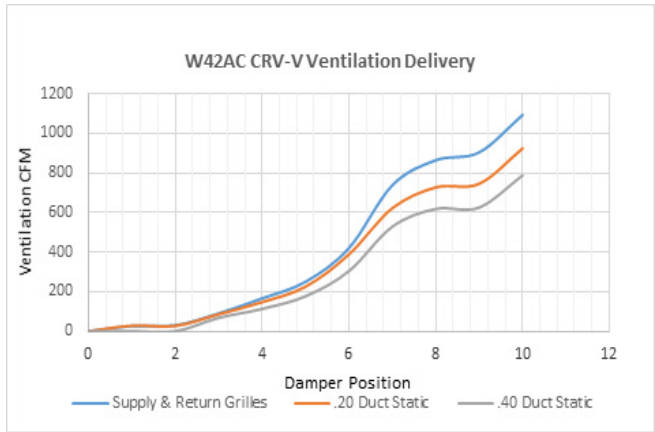


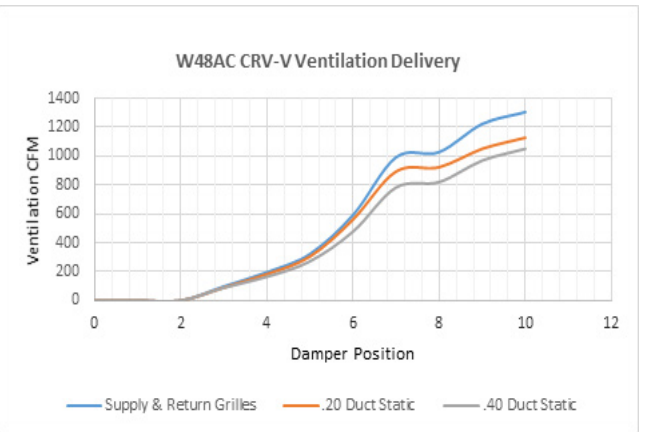


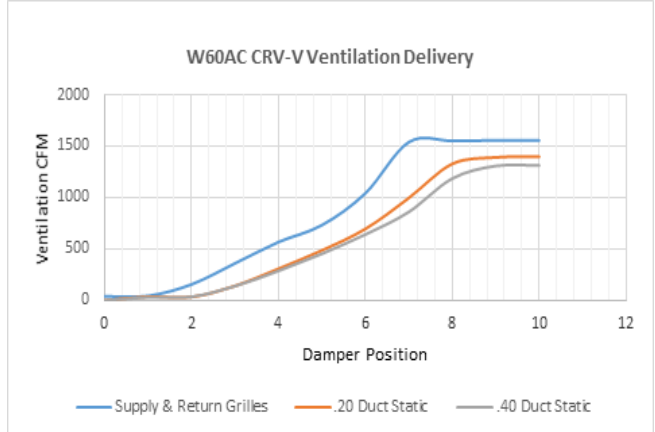


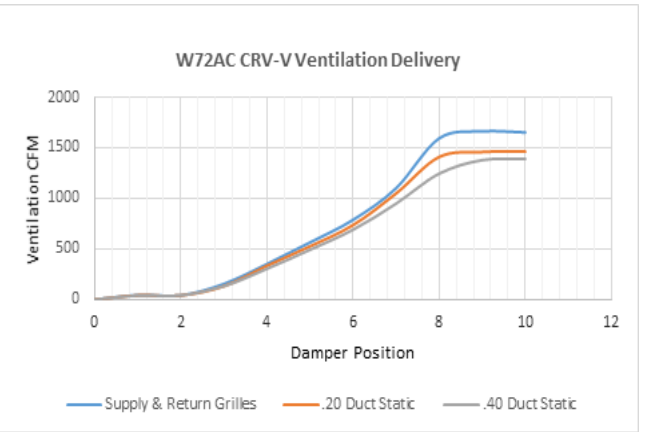


"V" (CRV-V) Vent Code Options



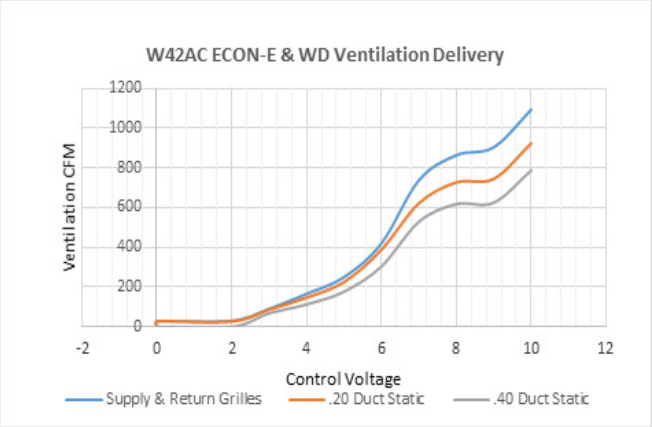


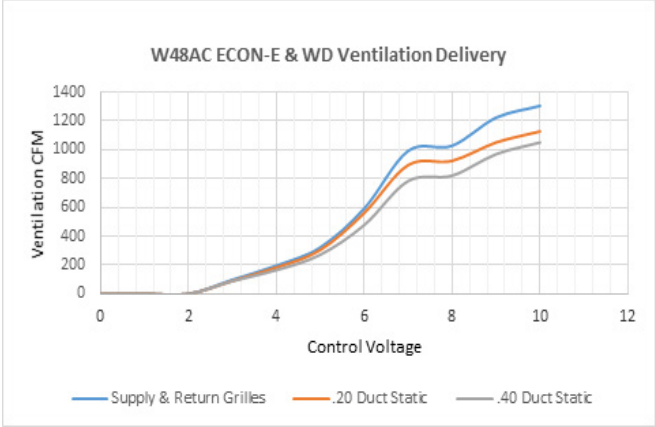


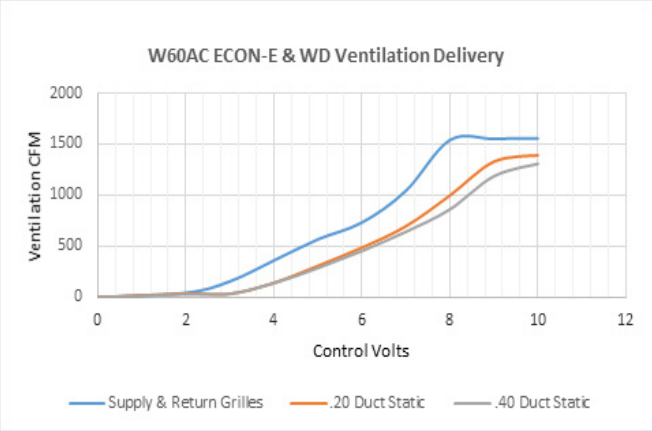


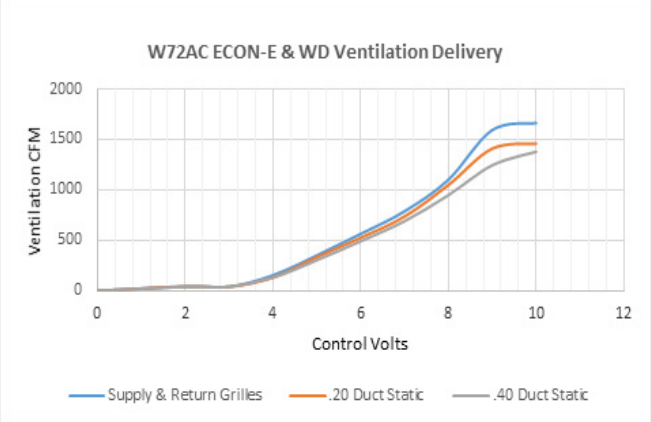
/////// WALL MOUNT™ VENTILATION AIRFLOW CHARTS

“Y” (ECON-DB), “Z” (ECON-WD), and “D” (ECON-NC) Vent Code Options









WALL MOUNT™ ENERGY RECOVERY VENTILATION (ERV) PERFORMANCE

"R" (ERV-FA5 and ERV-FC5) Vent Code Options for W42, W48, W60, and W72

SUMMER COOLING PERFORMANCE (INDOOR DESIGN CONDITIONS 75°DB/62°WB)

AMBIENT O.D.		VENTILATION RATE -- 400 CFM 63% EFFICIENCY						VENTILATION RATE -- 325 CFM 64% EFFICIENCY						VENTILATION RATE -- 250 CFM 65% EFFICIENCY					
DB/WB	F	VLT	VLS	VLL	HRT	HRS	HRL	VLT	VLS	VLL	HRT	HRS	HRL	VLT	VLS	VLL	HRT	HRS	HRS
105	75	21465	14580	6884	13952	9477	4475	17887	12150	5737	11805	8018	3786	14310	9720	4590	9587	6512	3075
	70	14580	14580	0	9477	9477	0	12150	12150	0	8018	8018	0	9720	9720	0	6512	6512	0
	65	14580	14580	0	9477	9477	0	12150	12150	0	8018	8018	0	9720	9720	0	6512	6512	0
100	80	31590	12150	19440	20533	7897	12635	26325	10125	16200	17374	6682	10692	21060	8100	12960	14110	5427	8683
	75	21465	12150	9314	13952	7897	6054	17997	10125	7762	11805	6682	5123	14310	8100	6210	9587	5427	4160
	70	12352	12150	202	8029	7897	131	10293	10125	168	6793	6682	111	8235	8100	135	5517	5427	90
	65	12150	12150	0	7897	7897	0	10125	10125	0	6682	6682	0	8100	8100	0	5427	5427	0
	60	12150	12150	0	7897	7897	0	10125	10125	0	6682	6682	0	8100	8100	0	5427	5427	0
95	80	31590	9720	21870	20533	6318	14215	26325	8100	18225	17374	5345	12028	21060	6480	14580	14110	4341	9768
	75	21465	9720	11744	13952	6318	7634	17887	8100	9787	11805	5345	6459	14310	6480	7830	9587	4341	5246
	70	12352	9720	2632	8029	6318	1711	10293	8100	2193	6793	5345	1447	8235	6480	1755	5517	4341	1175
	65	9720	9720	0	6318	6318	0	8100	8100	0	5345	5345	0	6480	6480	0	4341	4341	0
	60	9720	9720	0	6318	6318	0	8100	8100	0	5345	5345	0	6480	6480	0	4341	4341	0
90	80	31590	7290	24300	20533	4738	15794	26325	6075	20250	17374	4009	13365	21060	4860	16200	14110	3256	10854
	75	21465	7290	14175	13952	4738	9213	17887	6075	11812	11805	4009	7796	14310	4860	9450	9587	3256	6331
	70	12352	7290	5062	8029	4738	3290	10293	6075	4218	6793	4009	2784	8235	4860	3375	5517	3256	2261
	65	7290	7290	0	4738	4738	0	4050	6075	0	4009	4009	0	4860	4860	0	3256	3256	0
	60	7290	7290	0	4738	4738	0	4050	6075	0	4009	4009	0	4860	4860	0	3256	3256	0
85	80	31590	4860	26730	20533	3159	17374	26325	4050	22275	17374	2672	14701	21060	3240	17820	14110	2170	11939
	75	21465	4860	16605	13952	3159	10793	17887	4050	13837	11805	2672	9132	14310	3240	11070	9587	2170	7416
	70	12352	4860	7492	8029	3159	4870	10293	4050	6243	6793	2672	4120	8235	3240	4995	5517	2170	3346
	65	4860	4860	0	3159	3159	0	4050	4050	0	2672	2672	0	3240	3240	0	2170	2170	0
	60	4860	4860	0	3159	3159	0	4050	4050	0	2672	2672	0	3240	3240	0	2170	2170	0
80	75	21465	2430	19035	13952	1580	12372	17887	2025	15862	11805	1336	10469	14310	1620	12690	9587	1085	8502
	70	12352	2430	9922	8029	1580	6449	10293	2025	8268	6793	1336	5457	8235	1620	6615	5517	1085	4432
	65	4252	2430	1822	2764	1580	1184	3543	2025	1518	2338	1336	1002	2835	1620	1215	1899	1085	814
	60	2430	2430	0	1579	1580	0	2025	2025	0	1336	1336	0	1620	1620	0	1085	1085	0
75	70	12352	0	12352	8029	0	8029	10293	0	10293	6793	0	6793	8235	0	8235	5517	0	5517
	65	4252	0	4252	2764	0	2764	3543	0	3543	2338	0	2338	2835	0	2835	1899	0	1899
	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ERV-FA5 WINTER HEATING PERFORMANCE (INDOOR DESIGN CONDITIONS 70°F DB)

AMBIENT O.D.	VENTILATION RATE					
	450 CFM 80% EFF.		375 CFM 81% EFF.		300 CFM 82% EFF.	
DB/°F	WVL	WVL	WVL	WVL	WVL	WHR
65	2430	1944	2025	1640	1620	1328
60	4860	3888	4050	3280	3240	2656
55	7290	5832	6075	4920	4860	3985
50	9720	7776	8100	6561	6480	5313
45	12150	9720	10125	8201	8100	6642
40	14580	11664	12150	9841	9720	7970
35	17010	13608	14175	11481	11340	9298
30	19440	15552	16200	13122	12960	10627
25	21870	17496	18225	14762	14580	11955
20	24300	19440	20250	16402	16200	13284
15	26730	21384	22275	18042	17820	14612

NOTE: Sensible performance only is shown for winter application.

LEGEND:

VLT = Ventilation Load - Total
VLS = Ventilation Load - Sensible
VLL = Ventilation Load - Latent
HRT = Heat Recovery - Total
HRS = Heat Recovery - Sensible
HRL = Heat Recovery - Latent
WVL = Winter Ventilation Load
WHR = Winter Heat Recovery

/////// CABINET AND COIL OPTIONS

Cabinet Finish Options

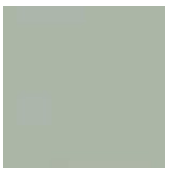
Unit models are available in Beige, White, Buckeye Gray, Desert Brown, Dark Bronze, stainless steel, and aluminum. Painted cabinet construction is comprised of 20 gauge Zinc coated steel. Parts are cleaned, rinsed, sealed, and dried before a polyurethane primer is applied. The cabinet coating is completed with a baked on textured enamel. The resulting finish is designed to withstand 1000 hours of salt spray tests per ASTM B117-03.

Stainless steel external cabinet construction is comprised of 316 grade materials. Stainless steel screws and fasteners are used in all externally exposed areas. A corrosion resistant coated fan blade and stainless steel condenser motor mount is provided.

Aluminum external cabinet construction is ASTM B 209 grade .06" thickness with a stucco appearance.

X—Beige

1—White



4—Gray

5—Desert

8—Bronze

S—Stainless

A—Aluminum

Stainless Steel Cabinet Construction

Exterior Stainless Steel finish cabinets are often selected for corrosion and chemical resistance. Higher grades of stainless steel are often specified to meet the requirements of harsh environments. Units may not only be exposed to wind - blown dust, dirt, lint, and fibers but also may be exposed to corrosive agents. The Bard stainless steel unit offers a high quality stainless steel grade enclosure and fasteners for years of operation in these conditions.

Features:

- Sides, doors, grilles, back panels, and top are 316 grade stainless steel.
- Base, condenser partition, and fan shroud are 304 grade stainless steel.
- Stainless steel exterior cabinet screws, washers, nuts, and bolts, are used.
- Stainless steel outdoor motor mount and motor mount hardware.
- Compressor mounting hardware is stainless steel and hex no-spin rivet nuts are used in the unit base.
- Corrosion resistant coating is applied to fan blade.

Bard highly suggests units exposed to extremely harsh environments, high quantities, of airborne dirt and dust, or sprayed with water hose and splashing water be ordered with the Blank Off Plate (BOP) ventilation option unless codes require fresh air intake. The BOP ventilation option installs plates over the fresh air intake and exhaust openings.

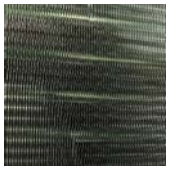
Green Fin Hydrophilic Evaporator Coils Standard On All Units

Bard WALL MOUNT products include a green protective coating applied to the aluminum fin stock used for the evaporator coil. The evaporator coil coating is hydrophilic (attracts water) and allows for proper condensate drainage along with mild corrosion protection. Resistance to corrosive agents include ammonia, sodium hydroxide, sodium chloride, acidic solutions and solvents.

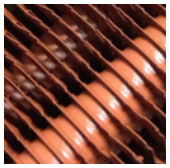
/////// CABINET AND COIL OPTIONS

Evaporator and Condenser Coil Technicoat Coating Options

All models utilize a copper/aluminum evaporator and condenser coil. An additional corrosion resistant TechniCoat 10-2™ coating may be ordered for the condenser coil (option 1), evaporator coil (option 2) or both evaporator and condenser coils (option 3). TechniCoat is a proprietary epoxy-modified phenolic dip coating. Total Immersion ensures complete coverage with no significant loss of thermal efficiency. The 4-step coating system consist of (1) a multi-step cleaning process, (2) chemical etch primer, (3) epoxy-modified phenolic, and (4) phenolic sealer. The result is a corrosion resistant coil that outperforms a copper finned coil, is less expensive, and is also nearly 3 times lighter. ASTM B117 salt spray tests conducted show over 4500 hours with "no fin corrosion or degradation."



Hydrophilic Green Coil (standard)



AeroMarine (optional)

Cabinet Coating Options

Bard recommends unit coatings be used in applications that may be exposed to corrosive particulates in the airstream. These applications include wastewater treatment plants, gas and oil refinery operations, battery manufacturers, areas with Sulfur water, wineries, chemical plants, pulp and paper mills, and seacoast installations. Contact your Bard distributor for additional information regarding cabinet coating options.

4= Exterior Unit Cabinet & Condenser Section

The 4 option unit contains our corrosion resistance phenolic coated coils and a coated unit condenser section. By coating the condenser section, the copper tubing, motor mount, sheet metal parts, filter/drier and compressor housing in the condenser area are protected with a epoxy semi-gloss coating.

5= Exterior & Interior

The 5 option unit contains our corrosion resistance phenolic coated coils and is both internally and externally coated. By coating the interior and exterior of the unit, the copper tubing, motor mount, sheet metal parts, filter/drier, compressor housing, blower assembly, and any optional ventilation features are protected with a epoxy semi-gloss coating. This is the highest level of protection available. It is required for applications where the internal and external features of the unit are exposed to a high level of salt or corrosive chemicals.

/////// OPTIONAL DIP COATED EVAPORATOR AND CONDENSER COIL

Bard now offers TECHNICOAT AA, a robust dipped coating option for the evaporator and condenser coil. TECHNICOAT AA has passed all HVAC accelerated tests like salt spray, flexibility and SWAAT 3,000+ hours. It has been tested in the field in the most severe industrial exposure conditions, such as a coastal refinery in Saudi Arabia, mining facilities in central Africa, and various Pacific islands. TECHNICOAT AA did not show any deterioration after multiple years of function with coils directly exposed to such harsh environmental conditions. The TECHNICOAT AA coating system is based on modified acrylic waterborne binders with high elongation properties. Aluminum pigmentation has been added to establish exceptional heat transfer, chemical resistance, and UV blocking properties. Corrosion resistance reaches >10,000+ hours in ASTM B-117 and >3.120 hours in SWAAT testing. Coating is gray in color.

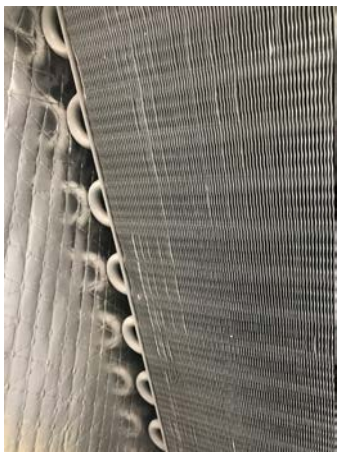
TEMPERATURE RESISTANCE:
- Maximum up to 248°F (120°C), 480°F (250°C) peak exposure
- Minimum -40°F (-40°C)

CHEMICAL RESISTANCE:
- Alkalines including Ammonaic solution, Potassium Hydroxide, Calcium Hydroxide, and Magnesium Hydroxide.
- Alcohols including Isopropanol, Butanol, Amyl Alcohol, Benzyl Alcohol, Diaceton Alcohol, Glycerine, Propanol, and Pentanol
- Aliphatic Hydrocarbons including White Spirit, Shellsol, Bitumen, Isopar G, and Paraffin.
- Amines including Triethanolamine, Aniline Sulphate, Hexamethylenetetraamine, Phenyldiamine, Triethylamine, and Methylamine.
- Inorganic Compounds including Hydrogen Carbonate, Hydrogen Sulfide, Nitrous Acid, Sulphuric Acid, and Selenic Acid.
- Aromatic Hydrocarbons including Xylene, Toluene, Asphalt, Anthracene, Benzapherene, Gumlac, Benzine, and Naphtha.
- Fuels and Oils including Diesel, Fuel Oil, Petrol, Super Petrol, Lubricating Oils, Kerosene, Spheric Oils, LPG, and Mineral Oil.
- Ethers including Enthric Oils, Vegetable Oils, Butane, Acetylene, and Methane.
- Halogenated Hydrocarbons including Amyl Acetate, Propyl Acetate, Ethyl Oxalate, Butyl Acetate, and Butyl Propionate.
- Softeners including Palatinol C, Chloraparaffine 5XX, Dioctylphosphate, Desavin, Mesamol, and Dibutylphosphate.
- Organic Compounds including Benzoic Acid, Lactic Acid, Phenols, Fatty Acids, Malic Acid, and Picric Acid.
- Salts and water solutions including Sodium, Potassium, Calcium, Aluminum, Ammonium, Barium, Copper, Lead, and Lithium.
- Many other agents including Phosphor, Zinc, Glucose Syrup, Sulfur, Urea, Menthol, Antimony, Hydrogen, Rubber, and Shellac.

Contact your local Bard distributor or representative for a list of all chemicals and chemical resistance information.

SPECIAL PROPERTIES:
- Anti-Odor
- Hydrophilic / Hydrophobic
- Anti-Corrosive

EXPOSURE CONDITIONS INCLUDE:
Food Processing & Storage, Airports, Office Buildings, Hotels, Schools, Warehouses, Water Treatment, Breweries, Paper Mills, Refineries, Power Plants, Meat Processing Industries, Automotive Industries and other locations near shorelines and salt water.



/////// WALL MOUNT™ FACTORY INSTALLED CONTROLS OPTIONS

Factory installed controls are provided by Bard to enhance a WALL MOUNT product before it is shipped. All WALL MOUNT products are shipped with a auto-reset high pressure switch and an auto-reset low pressure switch to help protect refrigeration components. A compressor control module with adjustable voltage protection, delay on make and break, and high/low pressure diagnostics is also standard

CONTROL CODE	DESCRIPTION OF FACTORY INSTALLED COMPONENTS
X	Hi Pressure Switch, Low Pressure Switch, Compressor Control Module.
E	Hi Pressure Switch, Low Pressure Switch, Compressor Control Module, **Low Ambient Control**
F	Hi Pressure Switch, Low Pressure Switch, Compressor Control Module, **Low Ambient Control, Dirty Filter Press. Switch**
J	Hi Pressure Switch, Low Pressure Switch, Compressor Control Module, **Low Ambient Control, Alarm Relay**
K	Hi Pressure Switch, Low Pressure Switch, Compressor Control Module, **Low Ambient Control, PTCR Start Kit**
M	Hi Pressure Switch, Low Pressure Switch, Compressor Control Module, **Low Ambient Control, Alarm Relay, PTCR Start Kit**
V	Hi Pressure Switch, Low Pressure Switch, Compressor Control Module, **Low Ambient Control, Alarm Relay, Discharge temperature sensor, Indoor Blower Airflow Press. Switch, Compressor Current Sensor, Dirty Filter Pressure Switch**

/////// WALL MOUNT™ FIELD INSTALLED KITS

Field installed kits provide accessories that can be installed in the field. Required components, wires, enclosures, screws, and instructions that are needed are provided within the kit.

CONTROL CODE	KIT PART NO.	UNITS USING KIT	DESCRIPTION OF FIELD INSTALLED KIT
NA	CMC-32	W42A, W48A, W60A, W72A	PTCR Start Kit. Increases starting torque by 2 to 3x. 230V-60hz-1 phase (A voltage) only. Cannot be used in combination with SK start kit
NA	CMC-33	W42A, W48A, W60A, W72A	Dirty Filter Kit
E	CMA-39	W42A, W48A, W60A, W72A	Low Ambient Control allows compressor cooling between 0°F and 50°F outdoor temp. - fan cycling
NA	CMC-35	W42A, W48A, W60A, W72A	Alarm Relay Kit
NA	CMA-43	W42A, W48A, W60A, W72A	Outdoor Thermostat Kit used to disable compressor cooling below 50°F outdoor temp. Adjustable between 50° and 0°F
V	CMA-44	W42A, W48A, W60A, W72A	Kit Includes Discharge temperature sensor, Indoor Blower Airflow Press. Switch, Compressor Current Sensor, Dirty Filter Pressure Switch
NA	CMC-38	W42A, W48A, W60A, W72A	Crank case heater kit. 230V units only.
NA	CMC-39	W42A, W48A, W60A, W72A	Crank case heater kit. 460V units only.

24VAC LOW VOLTAGE TERMINAL DESIGNATIONS

Bard WALL MOUNT products provide 24VAC power to controllers and thermostats. They also are able to receive 24VAC signals from a controlling device. The V controls option provides additional sensors for use with a field supplied DDC controls systems. The information below provides terminal designations and how they are used in the WALL MOUNT unit. More information on low voltage connections and operational sequences is provided in the unit installation manual.

Terminal	Unit	Description
R	All Units	24VAC low voltage output (HOT Terminal)
RT	All Units	RT terminal has jumper to R terminal. When jumper is removed, R and RT can be used with normally closed contacts for fire/smoke detector for unit shutdown.
C	All Units	Ground Terminal
G	All Units	Indoor fan input
Y1	All Units	1st Stage cooling input. Economizer stage when used. Balanced Climate stage when used. Remove jumper between Y1 and Y2 for 2 stage blower operation.
Y2	All Units	2nd Stage cooling input. Compressor cooling stage when Econ or Balanced Climate is used.
B/W1	All Units	1st Stage electric heat
W2	All Units	2nd State electric heat. Jumper between W1 and W2 must be removed for staged heat
A	Vent option units only	Ventilation option input. Calls for occupied vent air intake for CRV, ERV, ECON
D	Dehum. units only	Dehumidification input on units equipped with mechanical reheat dehumidification
L	All Units	24VAC Alarm active output
1	C, J, M, V Control Opt.	Alarm relay Normally Closed Contract
2	C, J, M, V Control Opt.	Alarm relay Normally Open Contact
3	C, J, M, V Control Opt.	Alarm Relay Common Contact
9	V Controls Option Only	Discharge Air Sensor, 10K ohm
10	V Controls Option Only	Discharge Air Sensor, 10K ohm
11	G, V Control Options	Filter Switch, Normally Open Contacts
12	G, V Control Options	Filter Switch, Normally Open Contacts
13	V Controls Option Only	Blower Airflow Switch, Normally Open Contacts
14	V Controls Option Only	Blower Airflow Switch, Normally Open Contacts
15	V Controls Option Only	Compressor Current Sensor, Normally Open Contacts
16	V Controls Option Only	Compressor Current Sensor, Normally Open Contacts

/////// OPTIONAL CONTROLS AND KIT COMPONENT DEFINITIONS

Hi Pressure Control (HPC) - The high pressure control provides a means of protecting the refrigeration circuit when high system pressures occur. It is a auto-reset device that is connected to the Compressor Control Module. When activated, the compressor is disabled until pressures reach an acceptable level. If activated twice in the same cooling call, compressor operation is locked out until the cooling call is interrupted.

Low Pressure Control (LPC) - The low pressure control provides a means of protecting the refrigeration circuit when extremely low system pressures occur. It is a auto-reset device that is connected to the Compressor Control Module. When activated, the compressor is disabled until pressures reach an acceptable level.

Compressor Control Module (CCM) - The compressor control module locks out compressor operation to protect the refrigeration system based on signals from the hi and low pressure switches. It provides diagnostics to indicate when a refrigerant pressure event occurs, and also sends a signal to the alarm relay. Low incoming unit power protection suspends compressor operation when incoming voltage is too low. Suspending compressor operation avoids reverse scroll operation. The low voltage feature is adjustable or can be disables. An adjustable delay on break timer is provided. Delay on make is 2 mins. plus 10% of delay on break setting.

Alarm Relay (ALR) - The alarm relay provides a set of NO and NC pilot duty contacts that operate when the compressor control module locks out compressor operation because of a high or low system refrigerant pressure event.

Low Ambient Control (LAC) - The low ambient control pressure sensor is attached to the suction line of the system, and monitors low side system pressure. Operation of the LAC occurs as outdoor temperatures drop below the 65°F. On/Off and modulating controls are used. On/Off LAC operation cycles the condenser fan operation based on outdoor temperature. Modulating LAC operation is factory adjusted and slows the condenser fan speed RPM based on outdoor temperature.

Crankcase Heater (CCH) - The heater is a belly band that is installed around the base of the compressor that applies heat when the refrigeration system is not operational. This heat is meant to prevent refrigerant oil migration when the unit is not running. Normal scroll compressor use does not require the use of the CCH, and this option is only recommended for northern areas of the US and Canada with extreme cold operation. Field Install Option Only.

Outdoor Thermostat (ODT) - The outdoor thermostat measures outdoor temperatures and includes relay contacts (NO). The relay is located on the outer control panel and the sensor bulb is mounted to the fan shroud in the outdoor condenser section. When wired into the cooling signal inside the control panel, compressor operation can be disabled when temperatures are below the adjustable setting. Adjustment range is 0°F to 50°F.

PTCR Start Kit - PTCR (Precision Temperature Coefficient Resistor) start kit includes the start device and wires needed for installation. The device is located inside the unit control panel near the compressor capacitor and provides an increase in starting torque. The PTCR Start Kit is not normally required when a clean, stable power source is available for the unit. The kit can only be used in 230 Volt single phase units.

Start Capacitor and Potential Relay Start Kit - The kit includes a start capacitor and relay that is energized during startup of the compressor. The capacitor, relay, and needed wires are provided in a metal enclosure that is field installed in the outdoor section attached to the back. The Start Capacitor Kit is not normally required when a clean, stable power source is available for the unit. The kit can only be used in 230 Volt single phase units. Start capacitor kit cannot be used with the PTCR start kit installed.

Dirty Filter Switch Indicator (DFS) - The switch is adjustable and measures pressure drop across the unit filter surface. When pressure drop is higher than the switch setting NO and NC contacts are provided to indicate the filter needs to be serviced.

Discharge Air Sensor - The discharge air sensor provides a temperature reading of the supply air leaving the unit. The sensor is a 10K OHM @ 77°F measuring device. It is installed in the supply airstream in the heater bracket. Airflow Switch - The airflow switch measures the pressure differential between the blower inlet and outlet. It is located directly above the blower partition. Relay contacts (NO) are provided for V controls option that indicates the indoor blower assembly needs to be serviced. The F controls option has indicator light only.

Compressor Current Sensor - The compressor current sensor indicates when the compressor is operational by measuring Amp draw. It is located inside the unit control panel. Relay contacts (NO) are provided to indicate the compressor is not operating.

CABINET AND CLEARANCE DIMENSIONS - W**AC SERIES UNITS

CLEARANCES REQUIRED FOR SERVICE ACCESS AND ADEQUATE CONDENSER INLET AIRFLOW

MODELS	LEFT SIDE	RIGHT SIDE
W42AC, W48AC, W60AC, W72AC	20"	20"

1.) Follow all national, state, and local codes and regulations regarding the installation of heating and cooling equipment regarding Single Packaged Vertical Units (SPVU) including electrical access clearances.
2.) Field ventilation installation with the unit installed requires 40" on the left or right side of the unit.
3.) Bard recommends a minimum of 10 ft. between the unit front condenser air outlet and solid objects including fences, walls, bushes, and other airflow obstructions.
4.) Bard recommends a minimum of 15 ft. between the condenser air outlets of 2 units that are facing each other.
5.) Bard recommends a minimum clearance of 4" under the unit cabinet for condenser defrost drainage during heat pump operation.

MINIMUM CLEARANCES REQUIRED TO COMBUSTIBLE MATERIALS

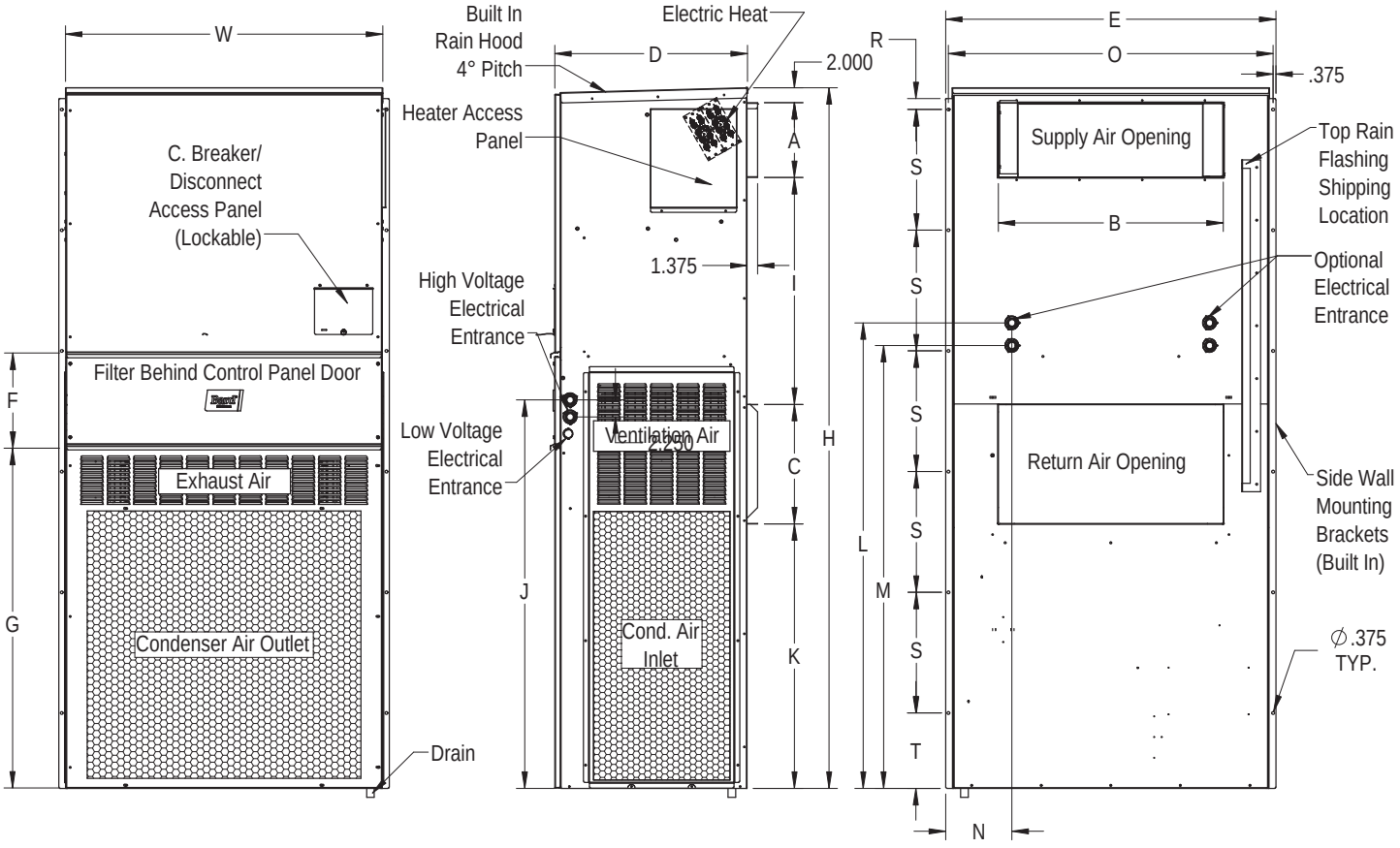
MODELS ①	SUPPLY AIR DUCT FIRST THREE FEET	CABINET
W42AC, W48AC, W60AC, W72AC	1/4"	0"

① Refer to the Installation Manual for more detailed information.

DIMENSIONS OF W42AC-72AC BASIC UNIT FOR ARCHITECTURAL & INSTALLATION REQUIREMENTS (NOMINAL)

MODEL	WIDTH (W)	DEPTH (D)	HEIGHT (H)	SUPPLY		RETURN														
				A	B	C	B	E	F	G	I	J	K	L	M	N	O	R	S	T
W42AC W48AC	42	25.52	84.88	9.88	29.88	15.88	29.88	43.88	12.63	39.06	30	53.75	26.94	55.59	52.59	8.82	43	1.438	16	1.88
W60AC W72AC	42	25.52	93.00	9.88	29.88	15.88	29.88	43.88	12.63	45	30	59.75	35.06	61.72	58.72	8.82	43	1.438	16	10.00

① Wall Mounting holes in side flanges are 0.375.



MIS-3978

/////// WALL CURB ACCESSORIES

Optional wall curb accessories are available to help reduce vibration through the outer wall surface or to use existing wall openings when replacing equipment. Follow all static pressure airflow requirements, safety and installation guidelines in the instructions provided with the curb and WALL MOUNT products.

CURB	UNITS USING CURB	DESCRIPTION
WMICF5-*	W42A, W48A,W60A, W72A	Provides vibration isolation for reduced sound transmission through wall
WWC5-*	W42A, W48A, W60A, W72A	Install to use with existing wall openings. Wall openings must provide sufficient airflow

* Color Option

/////// INDOOR SOUND REDUCTION ACCESSORIES

Optional sound accessories are available to help reduce sound transmission from the supply and return openings inside the indoor area. Follow all static pressure airflow requirements, safety and installation guidelines in the instructions provided with the accessories and WALL MOUNT products.

ACCESSORY	UNITS USING ACCESS.	DESCRIPTION
WAPR11-*	W42A, W48A, W60A, W72A	Acoustical return air plenum that offsets the return air path. Air intake at floor level

* Color Option

/////// NON-DUCTED SUPPLY AND RETURN GRILLES

Supply and return louver grilles are of a brushed aluminum finish. 2” flange versions are recommended for standard installations to allow grille attachment when large wall openings are present. Return filter grilles are available for filter access from an indoor area. Filter grilles do not include a filter, and are not recommended for unit with ventilation due to filter location. A manual damper return grille is available for W42 and W72 models. The manual damper is adjustable, and is only recommended for installations where increased return duct static pressure is required.

GRILLE NO.	UNITS USING GRILLE	DESCRIPTION OF LOUVER GRILLE
SG-5W	W42A, W48A, W60A, W72A	10" x 30" with 2" Flange 4 way deflection supply grille. **Use for standard installations**
RG-5W	W42A, W48A, W60A, W72A	16" x 30" with 2" Flange return grille. **Use for standard installations.**
RFG-5W	W42A, W48A, W60A, W72A	16” x 30” with 2” Flange return filter grille. **Not recommended for use as primary filter for units with vent options**
RGD-5	W42A, W48A, W60A, W72A	16" x 30" with 1" Flange return grille. Manual damper used to restrict return air

NON-DUCTED SUPPLY GRILLES - SPREAD AND THROW CHARACTERISTICS

One of the most important setup procedures for non-ducted supply applications is to adjust the 4 way supply grille blade positions. Placement of equipment, occupants, the thermostat, and room size can all play an important role in deciding how the conditioned supply air must be directed in an indoor area. The chart below may be used as a reference tool to help with this process.

SUPPLY GRILLE	AIRFLOW CFM	DEFLECTION	VELOCITY	TOTAL PRESSURE	THROW
SG-5W	1450 CFM	0°	968	.073" WC	51-73 ft.
		22.5°	1071	.103" WC	39-56 ft.
		45°	1331	.169" WC	28-40 ft.
	2000 CFM	0°	1336	.130" WC	61-86 ft.
		22.5°	1477	.188" WC	54-65 ft.
		45°	1835	.335" WC	33-46 ft.

CONTROLLER, THERMOSTAT, HUMIDISTAT AND CO2 VENTILATION CONTROL OPTIONS

Bard provides a wide variety of controllers for equipment cooling, thermostats, for equipment and comfort cooling, humidistats for dehumidification units, and CO2 sensors for ventilation control. Lockable thermostat covers are available for applications where security or supervisory control is desired.

CONTROLLER	OPERATION	DESCRIPTION
MC-4002	2 Unit Lead/Lag Controller	Standard Lead/Lag Controller with remote alarming capability.

THERMOSTAT	OPERATION	DESCRIPTION
8403-060	3 Heat/3 Cool	Programmable or Nonprogrammable, ventilation output, dehumidification operation
8403-089	1 Heat/1 Cool	Temp. Settings per Day 4, 2, 1, 0 Programs per Week 7, 5-2, 5-1-1 or Nonprogrammable
8403-090	2 Heat/2 Cool	Temp. Settings per Day 4, 2, 1, 0 Programs per Week 7, 5-2, 5-1-1 or Nonprogrammable
8403-091	1 Heat/1 Cool	Easy to use, Nonprogrammable. FEMA use
8403-092	2 Heat/2 Cool	Programmable or Nonprogrammable, ventilation output, Wi-Fi

HUMIDISTAT	OPERATION	DESCRIPTION
8403-038	Humidity %RH	Easy to use w/SPDT switching. Ratings: Pilot duty 50VA @24V, 120VA @ 120/240V
8403-047	Humidity %RH	Electronic with display, EEPROM memory, lockable keypad, humidity sensor calibration

CO2 CONTROL	OPERATION	DESCRIPTION
S8403-067	CO2 PPM	CO2 ventilation control with digital display. On/Off or modulating ventilation operation

THERMOSTAT COVER*	SIZE	DESCRIPTION
8405-003	(Inside) 5-1/16" H x 6-1/16" W (Outside) 6-1/2" H x 7-1/2" W x 2-15/16" D	Clear acrylic with ventilation. Fits all thermostats except 8403-060
8405-005	(Inside) 5-7/8" H x 8-3/8" W (Outside) 7-1/4" H x 9-3/4" W x 3-3/8" D	Clear acrylic with ventilation. Fits all thermostats.
8405-006	(Inside) 5-1/16" H x 6-1/16" W (Outside) 6-3/8" H x 7-3/8" W x 2-7/8" D	Clear acrylic with ventilation. Fits all thermostats except 8403-060
8405-007	(Inside) 5-7/8" H x 8-3/8" W (Outside) 7-1/8" H x 9-5/8" W x 3-1/4" D	Beige painted steel cover with ventilation. Fits all thermostats.

* Thermostat covers include ventilation, but may effect temperature control reaction time. If security control lockout is needed, the 8403-060 thermostat provides input control lockout features.

Bard Manufacturing Company, Inc.
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419-636-1194
www.bardhvac.com

Due to our continuous product improvement policy, all specifications subject to change without notice.

Supplemental Instructions

Models:

W30ABD W36ABD W42ACD W48ACD W60ACD W72ACD

This model provides a unique dehumidification circuit for periods of low outdoor ambient temperature and high indoor humidity conditions.

Refer to Specification Sheets S3573 and S3583 for the standard features of the base units and this manual for electrical data.

Dehumidification Circuit

The dehumidification circuit incorporates an independent heat exchanger coil in the supply air stream. This coil reheats the supply air after it passes over the cooling coil without requiring the electric resistance heater to be used for reheat purposes. This results in very high mechanical dehumidification capability from the air conditioner on demand without using electric resistance reheat.

The dehumidification refrigerant reheat circuit is controlled by a dehumidification valve directing the refrigerant gas to the normal condenser during periods when standard air conditioning is required. During periods of high indoor humidity, a humidistat senses the need for mechanical dehumidification. It then energizes both the compressor circuit and the dehumidification valve, thus directing the hot refrigerant discharge gas into a separate desuperheating condenser circuit, which reheats the conditioned air before it is delivered to the room. The refrigerant gas is then routed from the desuperheating condenser to the system condenser for further heat transfer. When the humidistat is satisfied, the system automatically switches back to normal A/C mode and either continues to operate or turns off based on the signal from the wall thermostat. The result is separate humidity control at minimum operating cost.

Dehumidification Sequence of Operation

Dehumidification is controlled through the thermostat (if capable) or through a separate humidistat. On a call for dehumidification mode of operation, the compressor and dehumidification valve of the unit are energized through circuit R - D to provide dehumidification. Dehumidification will continue until the humidistat is satisfied.

Any time there is a call for circuit R - Y1, the dehumidification mode will cancel and the system will return to cooling operation.

Balanced Climate™ Mode

It is recommended to enable Balanced Climate mode and utilize a 2-stage thermostat to enhance the dehumidification performance and comfort. To activate this mode, the jumper between Y1 and Y2 on the low voltage terminal strip needs to be removed and the unconnected purple wire laying in the cable duct needs to be pulled out and placed on the terminal block so that it connects to the yellow wire from the outdoor temperature switch. Refer to the unit wiring diagram for clarity.

NOTE: *In units with dehumidification, never have both the Balanced Climate jumper in place and the outdoor temperature switch connected at the same time!*

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Manual: 7960-811H
Supersedes: 7960-811G
Date: 8-3-20

This mode will allow the indoor blower to run at a reduced airflow on the first stage of cooling. A 2-stage thermostat connected to Y2 will then allow the airflow to return to normal rated speed if the call for dehumidification or cooling is not satisfied within the allotted time frame specified by the thermostat. See latest revision of unit installation instructions 2100-689 or 2100-692 for more information regarding the Balanced Climate operation.

Electronic Expansion Valve

Operation

This model employs an electronic expansion valve (EEV) which meters the refrigerant to the evaporator. The EEV is made of a stepper motor that is controlled with a step output from the controller. The valve is capable of 480 steps which drives a needle valve that in turn regulates the flow of refrigerant. The EEV allows for tighter control and better capacity management in varying operating conditions than a standard TXV. The EEV system consists of the electronic valve and stator, control board, relay, suction temperature sensor and suction pressure transducer. The pressure transducer and temperature sensor monitor the suction line to provide real time data to the control board so that a real time superheat can be calculated. This then determines the EEV position. The controller is sent to maintain around 13° superheat. The relay is used to activate the EEV system's controller anytime that the compressor is energized.

WARNING/AVERTISSEMENT

- Exposure to high pressure refrigerant hazard.
- This unit is equipped with an electronic expansion valve. In order to fully recover refrigerant or evacuate the system during repairs, be sure to use service tool 2151-021 to manually open the electronic expansion valve or be sure to recover and evacuate from all service ports; suction, liquid, and discharge.
- Failure to do so could result in eye injuries and/or refrigerant burns.

- Exposition à un risque de réfrigérant à haute pression.
- Cet appareil est équipé d'un détendeur électronique. Afini de récupérer complètement le réfrigérant ou d'évacuer le système pendant les réparations, assurez-vous d'utiliser l'outil de service 2151-021 pour ouvrir manuellement le détendeur électronique ou assurrez-vous de récupérer et d'évacuer de tous les ports de service: aspiration, liquide et refoulement.
- Ne pas le faire pourrait entraîner des blessures auz yeux et / ou des brûlures de réfrigérant.

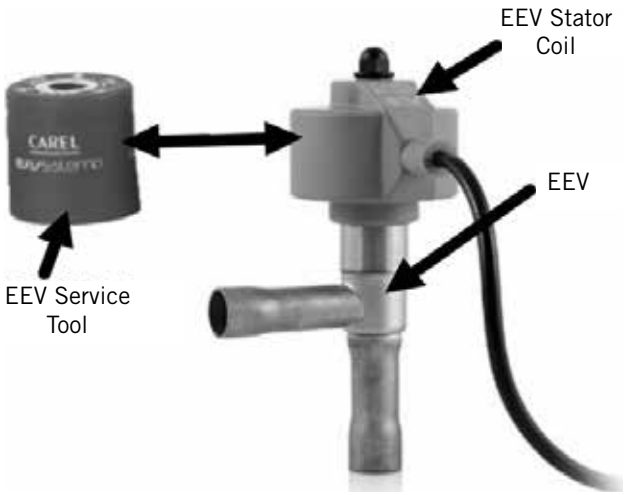
7961-953

EEV Instructions for Vacuuming, Reclaiming and Charging Unit

The electronic expansion valve moves to a closed position when there is no call to control. In order to pull a complete vacuum, fully reclaim the system or charge the unit, connections to all service ports—suction, liquid and discharge—need to be utilized or the valve needs to be manually opened first. The valve can be opened manually using the magnetic EEV service tool (Bard Part # 2151-021) shown in Figure 1. To do this, remove the EEV stator coil (red color with retaining nut on top), slide the magnetic tool over the shaft where the stator was removed and turn in a clockwise direction to open the valve to the full open position (directional arrows are provided on the tool).

Reapply the EEV stator coil and retaining nut once complete. Upon powering the unit back up, the control board will automatically drive the EEV back to the fully shut position. Once the compressor starts, the control board will again modulate the EEV position to control the system superheat.

FIGURE 1
Electronic Expansion Valve (EEV) and Service Tool



Troubleshooting the Electronic Expansion Valve

The control board has two status LEDs.

- The green LED should be lit anytime that the board has power and the control is functioning.
- The red LED is to show that an alarm is present.

See Table 1 for a guide to know where to start troubleshooting the EEV. Refer to the appropriate unit replacement parts manual for any parts that are needed.

Control Board

Check that the controller is getting 24VAC signal (GO 24VAC Hot and G 24VAC common). Reference unit wiring diagram for proper connections. If 24V is present but the green LED is not lit, replace the controller. If the green LED is now lit but the superheat is still not being maintained, troubleshoot the relay to check that the DI is connected to G; refer to **Relay in EEV Control Box** on page 3.

Electronic Expansion Valve

Check to see if valve can be moved by manually moving the stepper motor using the EEV service tool shown in Figure 1 (Bard Part # 2151-021). If valve still does not control, check the transducer and thermistor sensors as described on page 4. If sensors are good, replace the valve.

TABLE 1
Electronic Expansion Valve Troubleshooting

Problem	Probable Cause	Troubleshoot
The green LED is not lit.	Controller not receiving 24VAC signal.	Control Board
The green LED is lit, but superheat is not being maintained.	The relay is not closing the controller's DI connection to ground.	Relay
The red LED is flashing and EEV is not controlling superheat properly (13° superheat). One of the following is likely the fault:		
1. Low superheat is detected and the controller is taking steps to protect the system by closing the valve.	Stator is broken or connected incorrectly.	Stator
	Valve is stuck open.	EEV Valve
2. Suction temperature sensor error.	Poor connection of sensor or faulty sensor.	Thermistor
3. Suction pressure transducer error.	Pressure transducer wiring incorrect or faulty transducer.	Transducer
The red LED is on steady.	The operating parameters have been damaged.	Replace Control Board

Relay in EEV Control Box

Contacts NO to DI and COM to G must be closed for EEV control to start controlling superheat. Check that the relay is getting 24VAC. Reference unit wiring diagram for proper connections. If 24V is present, measure the resistance between COM and NO; it should be 0 ohms when the relay is getting 24V. If the resistance is out of range, replace the relay.

Stator Coil

Disconnect the stator from the valve and the control and measure the resistance of the windings using an electrical tester. The resistance of both windings should be around 40 ohms +/– 10%. The four wire sets that will have resistance between them are: White and red, green and red, yellow and purple, blue and purple. If the resistance falls outside these values, replace the stator.

Transducer Sensor

1. Check continuity of all three wires from transducer plug to controller plug. Replace wires if poor connection in any wire.
2. Check to ensure wires are correctly connected as follows:

   Blue wire = pin 1 of controller plug to pin C on transducer plug

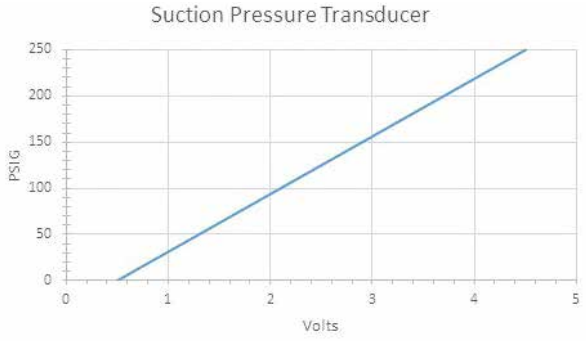
   Red wire = pin 2 of controller plug to pin B on transducer plug

   Black wire = pin 3 of controller plug to pin A on transducer plug
3. Check that there is 5VDC Nominal between the red and black wires going to the transducer.
4. Check the signal voltage between the blue and black wires (0.5-4.5VDC Actual). The following formula and Figure 2 can be used to determine if the transducer's voltage to pressure ratio is within range. Replace transducer if out of range.

Formula for Tech:

(Measured Pressure x .016) + .05 =
Expected Transducer Signal Voltage (see Figure 2)

FIGURE 2
Voltage to Pressure: Suction Pressure Transducer



Thermistor Sensor

1. Make a visual check for broken wire insulation, broken wires or cracked epoxy material.
2. Disconnect 10k ohm NTC thermistor from the EEV control box.
3. Use an ohmmeter to measure the resistance between the two connectors. Also use ohmmeter to check for short or open.
4. Compare the resistance reading to Table 2. Use sensor ambient temperature. (Tolerance of part is ±10 %.)
5. If sensor is out of tolerance, shorted, open or reads very low ohms, it should be replaced.

TABLE 2
10K Ohm NTC Sensor: Temperature/Resistance

Temperature		Resistance
F	C	Ω
-40	-40	188,500
-38.2	-39	178,500
-36.4	-38	169,000
-34.6	-37	160,200
-32.8	-36	151,900
-31	-35	144,100
-29.2	-34	136,700
-27.4	-33	129,800
-25.6	-32	123,300
-23.8	-31	117,100
-22	-30	111,300
-20.2	-29	105,700
-18.4	-28	100,500
-16.6	-27	95,520
-14.8	-26	90,840
-13	-25	86,430
-11.2	-24	82,260
-9.4	-23	78,330
-7.6	-22	74,610
-5.8	-21	71,100
-4	-20	67,770
-2.2	-19	64,570
-0.4	-18	61,540
1.4	-17	58,680
3.2	-16	55,970
5	-15	53,410
6.8	-14	50,980
8.6	-13	48,680
10.4	-12	46,500
12.2	-11	44,430
14	-10	42,470
15.8	-9	40,570
17.6	-8	38,770
19.4	-7	37,060
21.2	-6	35,440
23	-5	33,900
24.8	-4	32,440
26.6	-3	31,050
28.4	-2	29,730
30.2	-1	28,480
32	0	27,280
33.8	1	26,130
35.6	2	25,030
37.4	3	23,990
39.2	4	23,000
41	5	22,050
42.8	6	21,150
44.6	7	20,300
46.4	8	19,480
48.2	9	18,700
50	10	17,960
51.8	11	17,240
53.6	12	16,560
55.4	13	15,900
57.2	14	15,280
59	15	14,690
60.8	16	14,120
62.6	17	13,580
64.4	18	13,060
66.2	19	12,560
68	20	12,090
69.8	21	11,630
71.6	22	11,200
73.4	23	10,780
75.2	24	10,380
77	25	10,000
78.8	26	9,630
80.6	27	9,280
82.4	28	8,940
84.2	29	8,620
86	30	8,310
87.8	31	8,010
89.6	32	7,730
91.4	33	7,450
93.2	34	7,190
95	35	6,940
96.8	36	6,700
98.6	37	6,470
100.4	38	6,250
102.2	39	6,030
104	40	5,830
105.8	41	5,630
107.6	42	5,440
109.4	43	5,260
111.2	44	5,080
113	45	4,910
114.8	46	4,750
116.6	47	4,590
118.4	48	4,440
120.2	49	4,300
122	50	4,160
123.8	51	4,030
125.6	52	3,900
127.4	53	3,770
129.2	54	3,650
131	55	3,540
132.8	56	3,430
134.6	57	3,320
136.4	58	3,220
138.2	59	3,120
140	60	3,020
141.8	61	2,930
143.6	62	2,840
145.4	63	2,750
147.2	64	2,670
149	65	2,590
150.8	66	2,510
152.6	67	2,440
154.4	68	2,360
156.2	69	2,300
158	70	2,230
159.8	71	2,160
161.6	72	2,100
163.4	73	2,040
165.2	74	1,980
167	75	1,920
168.8	76	1,870
170.6	77	1,820
172.4	78	1,770
174.2	79	1,920
176	80	1,670
177.8	81	1,620
179.6	82	1,580
181.4	83	1,530
183.2	84	1,490
185	85	1,450
186.8	86	1,441
188.6	87	1,370
190.4	88	1,340
192.2	89	1,300
194	90	1,270
195.8	91	1,230
197.6	92	1,200
199.4	93	1,170
201.2	94	1,140
203	95	1,110
204.8	96	1,080
206.6	97	1,050
208.4	98	1,020
210.2	99	1,000
212	100	970

W30ABD Cooling and Dehumidification Application Data[1]

DB/WB[2]	OD Temp.	65°F[3]		70°F		75°F		80°F		85°F		90°F		95°F		100°F		105°F	
	Mode	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum
75/62.5 (50% RH)	Total Cooling Btuh	32,100	14,400	31,200	12,100	30,600	10,100	29,300	7,500	28,500	5,200	27,600	2,900	26,700	500	25,900		25,000	
	Sensible Btuh	22,500	5,400	22,000	3,700	21,500	2,300	21,100	300	20,700	(1,400)	20,300	(3,000)	20,000	(4,700)	19,700	(6,400)	19,400	(8,000)
	S/T	0.701	0.375	0.705	0.306	0.703	0.228	0.720	0.040	0.726	0	0.736	0	0.749	0	0.761	0	0.776	0
	Latent Btuh	9,600	9,000	9,200	8,400	9,100	7,800	8,200	7,200	7,800	6,600	7,300	5,900	6,700	5,200	6,200	4,500	5,600	3,800
	Lbs. H20/hr.	9.1	8.5	8.7	7.9	8.6	7.4	7.7	6.8	7.4	6.2	6.9	5.6	6.3	4.9	5.8	4.2	5.3	3.6
	Supply Air DB	52.5	67.9	52.9	70.2	53.3	72.4	53.7	74.6	54.0	76.8	54.4	79.0	54.8	81.1	55.1	83.3	55.4	85.5
	Supply Air WB	50.8	55.9	51.2	57.0	51.2	57.9	51.9	59.2	52.2	60.3	52.6	61.3	52.9	62.4	53.2	63.4	53.5	64.5
	Suction PSIG[4]	121	115	123	117	125	119	125	121	127	123	128	126	129	128	131	130	132	133
	Discharge PSIG[4]	271	228	291	243	311	257	335	272	358	288	382	304	408	320	434	336	462	353
75/64.1 (55% RH)	Total Cooling Btuh	32,900	15,400	32,000	13,100	31,100	10,900	30,200	8,500	29,300	6,200	28,400	3,900	27,600	1,500	26,700		25,900	
	Sensible Btuh	22,100	4,700	21,600	3,000	21,100	1,300	20,700	(400)	20,300	(2,100)	19,900	(3,800)	19,600	(5,400)	19,300	(7,100)	19,000	(8,700)
	S/T	0.672	0.31	0.675	0.23	0.678	0.12	0.685	0	0.693	0	0.701	0	0.710	0	0.723	0	0.734	0
	Latent Btuh	10,800	10,700	10,400	10,100	10,000	9,600	9,500	8,900	9,000	8,300	8,500	7,700	8,000	6,900	7,400	6,300	6,900	5,500
	Lbs. H20/hr.	10.2	10.1	9.8	9.5	9.4	9.1	9.0	8.4	8.5	7.8	8.0	7.3	7.5	6.5	7.0	5.9	6.5	5.2
	Supply Air DB	53.9	68.9	54.3	71.1	54.6	73.3	55.0	75.5	55.4	77.7	55.8	79.9	56.1	82.1	56.5	84.3	56.8	86.4
	Supply Air WB	52.3	57.0	52.6	58.1	53.0	59.2	53.3	60.3	53.7	61.4	54.0	62.4	54.4	63.5	54.7	64.5	55.0	65.6
	Suction PSIG[4]	125	118	126	120	127	122	129	124	130	127	131	129	133	131	134	134	136	136
	Discharge PSIG[4]	273	231	293	245	314	260	337	275	360	290	384	306	410	322	436	339	463	356
75/65.5 (60% RH)	Total Cooling Btuh	33,800	16,400	32,900	14,200	32,300	12,200	31,100	9,600	30,200	7,200	29,300	4,900	28,400	2,500	27,600	200	26,700	
	Sensible Btuh	21,600	3,900	21,100	2,200	20,700	800	20,200	(1,100)	19,900	(2,800)	19,500	(4,500)	19,200	(6,200)	18,900	(7,800)	18,600	(9,500)
	S/T	0.639	0.238	0.641	0.155	0.641	0.066	0.650	0	0.659	0	0.666	0	0.676	0	0.685	0	0.697	0
	Latent Btuh	12,200	12,500	11,800	12,000	11,600	11,400	10,900	10,700	10,300	10,000	9,800	9,400	9,200	8,700	8,700	8,000	8,100	7,300
	Lbs. H20/hr.	11.5	11.8	11.1	11.3	10.9	10.8	10.3	10.1	9.7	9.4	9.2	8.9	8.7	8.2	8.2	7.5	7.6	6.9
	Supply Air DB	55.2	69.8	55.6	72.1	56.0	74.3	56.4	76.5	56.8	78.7	57.1	80.9	57.5	83.1	57.8	85.2	58.2	87.4
	Supply Air WB	53.7	58.1	54.1	59.2	54.0	60.0	54.8	61.4	55.1	62.5	55.5	63.5	55.8	64.6	56.1	65.6	56.4	66.7
	Suction PSIG4	129	121	130	123	132	125	132	128	134	130	135	132	136	135	138	137	139	140
	Discharge PSIG4	274	233	295	248	314	262	338	277	362	293	386	309	411	325	438	341	465	358
75/66.7 (65% RH)	Total Cooling Btuh	34,600	17,400	33,700	15,200	33,200	13,200	31,900	10,600	31,000	8,200	30,100	5,900	29,300	3,600	28,400	1,200	27,600	
	Sensible Btuh	21,200	3,200	20,700	1,500	20,300	-	19,800	(1,900)	19,400	(3,600)	19,100	(5,200)	18,700	(6,900)	18,400	(8,600)	18,200	(10,200)
	S/T	0.613	0.18	0.614	0.10	0.611	0.00	0.621	0	0.626	0	0.635	0	0.638	0	0.648	0	0.659	0
	Latent Btuh	13,400	14,200	13,000	13,700	12,900	13,200	12,100	12,500	11,600	11,800	11,000	11,100	10,600	10,500	10,000	9,800	9,400	9,000
	Lbs. H20/hr.	12.6	13.4	12.3	12.9	12.2	12.5	11.4	11.8	10.9	11.1	10.4	10.5	10.0	9.9	9.4	9.2	8.9	8.5
	Supply Air DB	56.6	70.8	57.0	73.0	57.4	75.2	57.8	77.4	58.1	79.6	58.5	81.8	58.8	84.0	59.2	86.2	59.5	88.3
	Supply Air WB	55.2	59.1	55.5	60.3	55.5	61.1	56.2	62.5	56.6	63.5	56.9	64.6	57.2	65.7	57.6	66.7	57.9	67.7
	Suction PSIG[4]	132	125	133	127	135	129	136	131	137	133	139	136	140	138	142	140	143	143
	Discharge PSIG[4]	276	236	297	250	316	265	340	280	364	295	388	311	413	327	440	344	467	361
75/68 (70% RH)	Total Cooling Btuh	35,500	18,400	34,600	16,200	34,000	14,200	32,800	11,600	31,900	9,300	31,000	6,900	30,100	4,600	29,300	2,200	28,400	
	Sensible Btuh	20,800	2,500	20,300	800	19,800	(700)	19,400	(2,600)	19,000	(4,300)	18,600	(6,000)	18,300	(7,600)	18,000	(9,300)	17,700	(10,900)
	S/T	0.586	0.136	0.587	0.049	0.582	0	0.591	0	0.596	0	0.600	0	0.608	0	0.614	0	0.623	0
	Latent Btuh	14,700	15,900	14,300	15,400	14,200	14,900	13,400	14,200	12,900	13,600	12,400	12,900	11,800	12,200	11,300	11,500	10,700	10,700
	Lbs. H20/hr.	13.9	15.0	13.5	14.5	13.4	14.1	12.6	13.4	12.2	12.8	11.7	12.2	11.1	11.5	10.7	10.8	10.1	10.1
	Supply Air DB	58.0	71.7	58.4	74.0	58.7	76.2	59.1	78.4	59.5	80.6	59.9	82.8	60.2	85.0	60.6	87.1	60.9	89.3
	Supply Air WB	56.6	60.2	57.0	61.3	56.9	62.2	57.7	63.5	58.0	64.6	58.4	65.7	58.7	66.8	59.0	67.8	59.3	68.8
	Suction PSIG[4]	136	128	137	130	139	132	139	134	141	137	142	139	144	141	145	144	147	146
	Discharge PSIG[4]	278	238	298	252	318	267	342	282	365	298	390	314	415	330	441	346	469	363
80/68.3 (55% RH)	Total Cooling Btuh	35,200	18,400	34,300	16,100	33,800	14,100	32,500	11,500	31,600	9,200	30,700	6,800	29,900	4,500	29,000	2,100	28,200	
	Sensible Btuh	18,500	5,400	18,000	3,700	17,600	2,300	17,100	300	16,700	(1,400)	16,400	(3,000)	16,000	(4,700)	15,700	(6,400)	15,500	(8,000)
	S/T	0.526	0.29	0.525	0.23	0.521	0.16	0.526	0.03	0.528	0	0.534	0	0.535	0	0.541	0	0.550	0.00
	Latent Btuh	16,700	13,000	16,300	12,400	16,200	11,800	15,400	11,200	14,900	10,600	14,300	9,800	13,900	9,200	13,300	8,500	12,700	7,700
	Lbs. H20/hr.	15.8	12.3	15.4	11.7	15.3	11.1	14.5	10.6	14.1	10.0	13.5	9.2	13.1	8.7	12.5	8.0	12.0	7.3
	Supply Air DB	57.3	72.4	57.7	74.6	58.0	76.9	58.5	79.1	58.8	81.3	59.2	83.5	59.5	85.6	59.9	87.8	60.2	89.9
	Supply Air WB	56.7	60.4	57.0	61.5	57.0	62.4	57.7	63.7	58.1	64.8	58.4	65.9	58.7	66.9	59.1	68.0	59.4	69.0
	Suction PSIG[4]	135	130	136	132	138	134	138	136	140	138	141	141	143	143	144	145	146	148
	Discharge PSIG[4]	279	239	299	254	319	268	343	284	366	299	390	315	416	331	442	348	469	365

[1] Values listed are with ventilation package disabled

[2] Return air temperature °F @ Default airflow (950 CFM) for AC tests and Balanced Climate airflow (705 CFM) for dehumidification tests

[3] Below 50°F, unit requires a factory or field installed low ambient control.

[4] Suction pressure +/- 4 psi, Discharge pressure +/- 10 psi

W36ABD Cooling and Dehumidification Application Data[1]

DB/WB[2]	OD Temp.	65°F[3]		70°F		75°F		80°F		85°F		90°F		95°F		100°F		105°F	
	Mode	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum
75/62.5 (50% RH)	Total Cooling Btuh	39,800	18,700	38,700	16,200	37,500	13,700	36,500	11,100	35,300	8,500	34,200	5,900	33,000	3,200	31,800	400	30,600	
	Sensible Btuh	29,200	7,100	28,700	5,300	28,200	3,500	27,700	1,600	27,200	(300)	26,600	(2,200)	26,100	(4,200)	25,500	(6,100)	25,000	(8,100)
	S/T	0.734	0.380	0.742	0.327	0.752	0.255	0.759	0.144	0.771	0	0.778	0	0.791	0	0.802	0	0.817	0
	Latent Btuh	10,600	11,600	10,000	10,900	9,300	10,200	8,800	9,500	8,100	8,800	7,600	8,100	6,900	7,400	6,300	6,500	5,600	5,700
	Lbs. H20/hr.	10.0	10.9	9.4	10.3	8.8	9.6	8.3	9.0	7.6	8.3	7.2	7.6	6.5	7.0	5.9	6.1	5.3	5.4
	Supply Air DB	52.0	67.0	52.4	69.0	52.8	71.1	53.3	73.2	53.7	75.4	54.1	77.5	54.4	79.7	54.8	81.9	55.1	84.1
	Supply Air WB	50.5	55.1	51.0	56.1	51.3	57.0	51.7	58.1	52.1	59.2	52.4	60.2	52.8	61.3	53.1	62.5	53.4	63.6
	Suction PSIG[4]	125	119	127	120	128	120	130	122	131	123	133	124	134	126	135	128	137	130
	Discharge PSIG[4]	287	239	307	254	329	269	351	284	376	300	401	317	427	334	455	352	484	371
75/64.1 (55% RH)	Total Cooling Btuh	40,900	19,800	39,800	17,400	38,600	14,900	37,500	12,300	36,300	9,700	35,200	7,100	34,000	4,400	32,800	1,600	31,700	
	Sensible Btuh	27,500	6,200	27,000	4,400	26,500	2,500	26,000	700	25,500	(1,200)	25,000	(3,200)	24,500	(5,100)	23,900	(7,000)	23,300	(9,000)
	S/T	0.672	0.31	0.678	0.25	0.687	0.17	0.693	0.06	0.702	0	0.710	0	0.721	0	0.729	0	0.735	0
	Latent Btuh	13,400	13,600	12,800	13,000	12,100	12,400	11,500	11,600	10,800	10,900	10,200	10,300	9,500	9,500	8,900	8,600	8,400	7,800
	Lbs. H20/hr.	12.6	12.8	12.1	12.3	11.4	11.7	10.8	10.9	10.2	10.3	9.6	9.7	9.0	9.0	8.4	8.1	7.9	7.4
	Supply Air DB	53.2	68.0	53.6	70.1	54.1	72.2	54.5	74.3	54.9	76.4	55.3	78.6	55.6	80.7	56.0	83.0	56.4	85.2
	Supply Air WB	51.9	56.2	52.3	57.2	52.7	58.2	53.1	59.2	53.5	60.3	53.8	61.3	54.2	62.4	54.5	63.5	54.8	64.7
	Suction PSIG[4]	128	122	130	123	131	124	133	125	134	126	136	127	137	129	138	131	140	133
	Discharge PSIG[4]	288	242	309	256	330	271	353	287	377	303	402	320	429	337	457	355	485	373
75/65.5 (60% RH)	Total Cooling Btuh	41,900	21,000	40,800	18,600	39,500	16,100	38,500	13,500	37,400	10,900	36,200	8,300	35,000	5,600	33,900	2,800	32,700	
	Sensible Btuh	25,900	5,300	25,400	3,500	24,900	1,700	24,400	(300)	23,900	(2,100)	23,400	(4,100)	22,800	(6,000)	22,300	(7,900)	21,700	(9,900)
	S/T	0.618	0.252	0.623	0.188	0.630	0.106	0.634	0	0.639	0	0.646	0	0.651	0	0.658	0	0.664	0
	Latent Btuh	16,000	15,700	15,400	15,100	14,600	14,400	14,100	13,800	13,500	13,000	12,800	12,400	12,200	11,600	11,600	10,700	11,000	9,900
	Lbs. H20/hr.	15.1	14.8	14.5	14.2	13.8	13.6	13.3	13.0	12.7	12.3	12.1	11.7	11.5	10.9	10.9	10.1	10.4	9.3
	Supply Air DB	54.4	69.1	54.9	71.1	55.2	73.2	55.7	75.3	56.1	77.4	56.5	79.6	56.9	81.8	57.2	84.0	57.6	86.2
	Supply Air WB	53.3	57.3	53.7	58.3	54.0	59.2	54.5	60.3	54.8	61.3	55.2	62.4	55.5	63.5	55.9	64.6	56.2	65.8
	Suction PSIG[4]	131	125	133	126	134	126	136	128	137	129	138	130	140	132	141	134	143	136
	Discharge PSIG[4]	290	245	310	259	332	274	355	290	379	306	404	322	431	340	458	358	487	376
75/66.7 (65% RH)	Total Cooling Btuh	42,900	22,200	41,800	19,800	40,600	17,300	39,500	14,700	38,400	12,100	37,200	9,500	36,100	6,800	34,900	4,000	33,700	1,200
	Sensible Btuh	24,200	4,400	23,800	2,600	23,300	700	22,800	(1,200)	22,200	(3,100)	21,700	(5,000)	21,200	(6,900)	20,600	(8,800)	20,100	(10,800)
	S/T	0.564	0.20	0.569	0.13	0.574	0.04	0.577	0	0.578	0	0.583	0	0.587	0	0.590	0	0.596	0
	Latent Btuh	18,700	17,800	18,000	17,200	17,300	16,600	16,700	15,900	16,200	15,200	15,500	14,500	14,900	13,700	14,300	12,800	13,600	12,000
	Lbs. H20/hr.	17.6	16.8	17.0	16.2	16.3	15.7	15.8	15.0	15.3	14.3	14.6	13.7	14.1	12.9	13.5	12.1	12.8	11.3
	Supply Air DB	55.7	70.1	56.1	72.2	56.5	74.2	56.9	76.3	57.3	78.5	57.7	80.6	58.1	82.8	58.4	85.0	58.8	87.3
	Supply Air WB	54.7	58.4	55.1	59.4	55.4	60.3	55.8	61.4	56.2	62.4	56.6	63.5	56.9	64.6	57.2	65.7	57.5	66.9
	Suction PSIG[4]	134	128	136	129	137	129	139	131	140	132	141	133	143	135	144	137	146	139
	Discharge PSIG[4]	292	247	312	262	334	277	356	292	380	308	406	325	432	342	460	360	489	379
75/68 (70% RH)	Total Cooling Btuh	43,900	23,400	42,800	21,000	41,600	18,500	40,600	15,900	39,400	13,300	38,300	10,600	37,100	7,900	35,900	5,200	34,700	2,400
	Sensible Btuh	22,600	3,500	22,100	1,700	21,700	(200)	21,100	(2,100)	20,600	(4,000)	20,100	(5,900)	19,500	(7,800)	19,000	(9,700)	18,400	(11,700)
	S/T	0.515	0.150	0.516	0.081	0.522	0	0.520	0	0.523	0	0.525	0	0.526	0	0.529	0	0.530	0
	Latent Btuh	21,300	19,900	20,700	19,300	19,900	18,700	19,500	18,000	18,800	17,300	18,200	16,500	17,600	15,700	16,900	14,900	16,300	14,100
	Lbs. H20/hr.	20.1	18.8	19.5	18.2	18.8	17.6	18.4	17.0	17.7	16.3	17.2	15.6	16.6	14.8	15.9	14.1	15.4	13.3
	Supply Air DB	56.9	71.1	57.3	73.2	57.7	75.2	58.1	77.4	58.5	79.5	58.9	81.7	59.3	83.9	59.7	86.1	60.0	88.3
	Supply Air WB	56.0	59.5	56.4	60.4	56.7	61.4	57.2	62.5	57.6	63.5	57.9	64.6	58.3	65.7	58.6	66.8	58.9	68.0
	Suction PSIG[4]	137	131	139	132	140	132	142	134	143	135	144	136	146	138	147	140	149	142
	Discharge PSIG[4]	293	250	314	264	335	279	358	295	382	311	407	328	434	345	462	363	490	382
80/68.3 (55% RH)	Total Cooling Btuh	44,300	24,700	43,200	22,200	42,000	19,700	41,000	17,200	39,800	14,600	38,700	11,900	37,500	9,200	36,300	6,500	35,100	3,700
	Sensible Btuh	28,800	7,600	28,300	5,800	27,800	3,900	27,300	2,000	26,800	100	26,200	(1,800)	25,700	(3,700)	25,200	(5,700)	24,600	(7,600)
	S/T	0.650	0.31	0.655	0.26	0.662	0.20	0.666	0.12	0.673	0.01	0.677	0	0.685	0	0.694	0	0.701	0
	Latent Btuh	15,500	17,100	14,900	16,400	14,200	15,800	13,700	15,200	13,000	14,500	12,500	13,700	11,800	12,900	11,100	12,200	10,500	11,300
	Lbs. H20/hr.	14.6	16.1	14.1	15.5	13.4	14.9	12.9	14.3	12.3	13.7	11.8	12.9	11.1	12.2	10.5	11.5	9.9	10.7
	Supply Air DB	57.6	72.1	58.0	74.2	58.4	76.2	58.9	78.4	59.3	80.5	59.6	82.6	60.0	84.8	60.4	87.0	60.7	89.3
	Supply Air WB	56.4	59.5	56.8	60.5	57.1	61.4	57.5	62.5	57.9	63.5	58.3	64.6	58.6	65.7	58.9	66.8	59.2	68.0
	Suction PSIG[4]	138	133	140	134	141	134	143	136	144	137	145	139	147	140	148	142	150	144
	Discharge PSIG[4]	293	250	313	265	335	280	357	295	381	311	407	328	433	345	461	363	490	382

[1] Values listed are with ventilation package disabled

[2] Return air temperature °F @ Default airflow (1150 CFM) for AC tests and Balanced Climate airflow (790 CFM) for dehumidification tests

[3] Below 50°F, unit requires a factory or field installed low ambient control.

[4] Suction pressure +/- 4 psi, Discharge pressure +/- 10 psi

W42ACD Cooling and Dehumidification Application Data[1]

DB/WB[2]	OD Temp.	65°F[3]		70°F		75°F		80°F		85°F		90°F		95°F		100°F		105°F	
	Mode	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum
75/62.5 (50% RH)	Total Cooling Btuh	45,900	22,500	44,500	19,700	43,200	16,800	41,800	14,000	40,600	11,000	39,300	8,000	38,100	4,900	36,900	1,700	35,700	
	Sensible Btuh	33,300	9,200	32,600	7,000	32,100	4,900	31,500	2,500	30,900	300	30,300	(2,000)	29,800	(4,300)	29,300	(6,600)	28,800	(9,000)
	S/T	0.725	0.409	0.733	0.355	0.743	0.292	0.754	0.179	0.761	0.027	0.771	0	0.782	0	0.794	0	0.807	0
	Latent Btuh	12,600	13,300	11,900	12,700	11,100	11,900	10,300	11,500	9,700	10,700	9,000	10,000	8,300	9,200	7,600	8,300	6,900	7,500
	Lbs. H20/hr.	11.9	12.5	11.2	12.0	10.5	11.2	9.7	10.8	9.2	10.1	8.5	9.4	7.8	8.7	7.2	7.8	6.5	7.1
	Supply Air DB	52.6	66.1	53.0	68.3	53.3	70.4	53.8	72.6	54.2	74.8	54.5	76.9	54.9	79.1	55.3	81.4	55.6	83.6
	Supply Air WB	50.8	54.9	51.2	55.9	51.6	56.8	51.9	58.0	52.3	59.0	52.6	60.1	52.9	61.1	53.3	62.1	53.6	63.2
	Suction PSIG[4]	119	108	120	109	121	110	122	112	123	114	125	116	126	118	127	121	129	124
	Discharge PSIG[4]	274	243	295	260	315	273	339	292	362	307	384	322	407	335	431	348	455	360
75/64.1 (55% RH)	Total Cooling Btuh	47,200	24,000	45,800	21,200	44,500	18,300	43,200	15,400	41,900	12,400	40,600	9,400	39,400	6,300	38,200	3,200	37,000	
	Sensible Btuh	31,500	8,200	30,900	6,000	30,300	3,800	29,700	1,500	29,100	(700)	28,600	(3,000)	28,000	(5,300)	27,500	(7,600)	27,000	(10,000)
	S/T	0.667	0.34	0.675	0.28	0.681	0.21	0.688	0.10	0.695	0	0.704	0	0.711	0	0.720	0	0.730	0
	Latent Btuh	15,700	15,800	14,900	15,200	14,200	14,500	13,500	13,900	12,800	13,100	12,000	12,400	11,400	11,600	10,700	10,800	10,000	10,000
	Lbs. H20/hr.	14.8	14.9	14.1	14.3	13.4	13.7	12.7	13.1	12.1	12.4	11.3	11.7	10.8	10.9	10.1	10.2	9.4	9.4
	Supply Air DB	53.8	67.1	54.2	69.2	54.6	71.4	54.9	73.5	55.3	75.7	55.7	77.9	56.1	80.1	56.4	82.3	56.8	84.5
	Supply Air WB	52.2	56.0	52.6	57.0	53.0	58.0	53.3	59.0	53.7	60.1	54.0	61.1	54.3	62.2	54.6	63.2	54.9	64.3
	Suction PSIG[4]	122	111	123	112	124	113	125	115	126	117	128	119	129	122	130	124	132	128
	Discharge PSIG[4]	275	246	297	263	319	280	341	295	363	310	386	325	409	338	433	351	456	363
75/65.5 (60% RH)	Total Cooling Btuh	48,500	25,400	47,100	22,600	45,800	19,700	44,500	16,900	43,200	13,900	41,900	10,900	40,700	7,800	39,500	4,600	38,400	1,400
	Sensible Btuh	29,700	7,200	29,100	5,000	28,500	2,900	27,900	500	27,400	(1,700)	26,800	(4,000)	26,300	(6,300)	25,700	(8,600)	25,200	(11,000)
	S/T	0.612	0.283	0.618	0.221	0.622	0.147	0.627	0.030	0.634	0	0.640	0	0.646	0	0.651	0	0.656	0
	Latent Btuh	18,800	18,200	18,000	17,600	17,300	16,800	16,600	16,400	15,800	15,600	15,100	14,900	14,400	14,100	13,800	13,200	13,200	12,400
	Lbs. H20/hr.	17.7	17.2	17.0	16.6	16.3	15.8	15.7	15.5	14.9	14.7	14.2	14.1	13.6	13.3	13.0	12.5	12.5	11.7
	Supply Air DB	54.9	68.0	55.3	70.2	55.6	72.3	56.1	74.5	56.5	76.7	56.9	78.8	57.2	81.0	57.6	83.3	58.0	85.5
	Supply Air WB	53.6	57.0	54.0	58.1	54.3	59.0	54.7	60.1	55.0	61.1	55.4	62.2	55.7	63.2	56.0	64.3	56.3	65.3
	Suction PSIG[4]	125	114	126	115	127	117	128	118	129	120	131	122	132	125	134	128	135	131
	Discharge PSIG[4]	277	249	298	266	318	279	342	298	365	313	387	328	411	341	434	354	458	366
75/66.7 (65% RH)	Total Cooling Btuh	49,800	26,800	48,400	24,000	47,100	21,100	45,800	18,300	44,500	15,300	43,300	12,300	42,000	9,200	40,800	6,100	39,700	2,800
	Sensible Btuh	28,000	6,200	27,300	4,000	26,800	1,900	26,200	(500)	25,600	(2,700)	25,000	(5,000)	24,500	(7,300)	24,000	(9,600)	23,500	(12,000)
	S/T	0.562	0.23	0.564	0.17	0.569	0.09	0.572	0	0.575	0	0.577	0	0.583	0	0.588	0	0.592	0
	Latent Btuh	21,800	20,600	21,100	20,000	20,300	19,200	19,600	18,800	18,900	18,000	18,300	17,300	17,500	16,500	16,800	15,700	16,200	14,800
	Lbs. H20/hr.	20.6	19.4	19.9	18.9	19.2	18.1	18.5	17.7	17.8	17.0	17.3	16.3	16.5	15.6	15.8	14.8	15.3	14.0
	Supply Air DB	56.1	69.0	56.5	71.1	56.8	73.3	57.3	75.4	57.7	77.6	58.0	79.8	58.4	82.0	58.8	84.2	59.1	86.4
	Supply Air WB	55.0	58.1	55.3	59.1	55.7	60.0	56.1	61.2	56.4	62.2	56.8	63.2	57.1	64.3	57.4	65.3	57.7	66.4
	Suction PSIG[4]	128	118	129	119	130	120	131	121	133	123	134	126	135	128	137	131	138	134
	Discharge PSIG[4]	279	252	300	269	320	282	344	301	366	316	389	331	412	344	436	357	459	369
75/68 (70% RH)	Total Cooling Btuh	51,100	28,300	49,800	25,500	48,500	22,500	47,100	19,700	45,800	16,800	44,600	13,700	43,400	10,600	42,200	7,500	41,000	4,300
	Sensible Btuh	26,200	5,200	25,600	3,000	25,000	900	24,400	(1,500)	23,800	(3,700)	23,300	(6,000)	22,700	(8,300)	22,200	(10,600)	21,700	(13,000)
	S/T	0.513	0.184	0.514	0.118	0.515	0.040	0.518	0	0.520	0	0.522	0	0.523	0	0.526	0	0.529	0
	Latent Btuh	24,900	23,100	24,200	22,500	23,500	21,600	22,700	21,200	22,000	20,500	21,300	19,700	20,700	18,900	20,000	18,100	19,300	17,300
	Lbs. H20/hr.	23.5	21.8	22.8	21.2	22.2	20.4	21.4	20.0	20.8	19.3	20.1	18.6	19.5	17.8	18.9	17.1	18.2	16.3
	Supply Air DB	57.3	69.9	57.7	72.1	58.0	74.2	58.5	76.4	58.8	78.6	59.2	80.8	59.6	83.0	59.9	85.2	60.3	87.4
	Supply Air WB	56.4	59.2	56.7	60.2	57.1	61.1	57.5	62.2	57.8	63.3	58.1	64.3	58.5	65.4	58.8	66.4	59.1	67.5
	Suction PSIG[4]	131	121	132	122	133	123	134	125	136	127	137	129	138	131	140	134	141	137
	Discharge PSIG[4]	280	255	302	272	322	285	345	304	368	319	391	334	414	347	437	360	461	372
80/68.3 (55% RH)	Total Cooling Btuh	51,700	29,200	50,300	26,400	49,000	23,400	47,600	20,600	46,400	17,700	45,100	14,600	43,900	11,500	42,700	8,400	41,500	5,200
	Sensible Btuh	32,900	9,900	32,200	7,700	31,700	5,600	31,100	3,200	30,500	1,000	29,900	(1,300)	29,400	(3,600)	28,900	(5,900)	28,400	(8,300)
	S/T	0.636	0.34	0.640	0.29	0.647	0.24	0.653	0.16	0.657	0.06	0.663	0	0.670	0	0.677	0	0.684	0
	Latent Btuh	18,800	19,300	18,100	18,700	17,300	17,800	16,500	17,400	15,900	16,700	15,200	15,900	14,500	15,100	13,800	14,300	13,100	13,500
	Lbs. H20/hr.	17.7	18.2	17.1	17.6	16.3	16.8	15.6	16.4	15.0	15.8	14.3	15.0	13.7	14.2	13.0	13.5	12.4	12.7
	Supply Air DB	58.0	70.4	58.4	72.5	58.7	74.6	59.2	76.8	59.6	79.0	60.0	81.2	60.4	83.4	60.7	85.6	61.1	87.8
	Supply Air WB	56.3	59.2	56.7	60.2	57.0	61.2	57.4	62.3	57.7	63.3	58.1	64.4	58.4	65.4	58.7	66.4	59.0	67.5
	Suction PSIG[4]	131	121	132	122	133	123	135	125	136	127	137	129	139	132	140	135	141	138
	Discharge PSIG[4]	280	255	302	273	322	285	346	305	368	320	391	334	414	348	437	360	461	373

[1] Values listed are with ventilation package disabled

[2] Return air temperature °F @ Default airflow (1350 CFM) for AC tests and Balanced Climate airflow (950 CFM) for dehumidification tests

[3] Below 50°F, unit requires a factory or field installed low ambient control.

[4] Suction pressure +/- 4 psi, Discharge pressure +/- 10 psi

W48ACD Cooling and Dehumidification Application Data[1]

DB/WB[2]	OD Temp.	65°F[3]		70°F		75°F		80°F		85°F		90°F		95°F		100°F		105°F	
	Mode	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum
75/62.5 (50% RH)	Total Cooling Btuh	53,100	26,400	52,100	23,400	50,800	20,000	49,600	17,000	48,000	13,600	46,200	10,100	44,200	6,500	42,100	2,800	39,700	
	Sensible Btuh	39,800	11,100	39,300	8,700	39,200	6,300	38,200	3,900	37,500	1,400	36,700	(1,100)	35,900	(3,600)	35,000	(6,100)	34,000	(8,700)
	S/T	0.750	0.420	0.754	0.372	0.772	0.315	0.770	0.229	0.781	0.103	0.794	0	0.812	0	0.831	0	0.856	0
	Latent Btuh	13,300	15,300	12,800	14,700	11,600	13,700	11,400	13,100	10,500	12,200	9,500	11,200	8,300	10,100	7,100	8,900	5,700	7,700
	Lbs. H20/hr.	12.5	14.4	12.1	13.9	10.9	12.9	10.8	12.4	9.9	11.5	9.0	10.6	7.8	9.5	6.7	8.4	5.4	7.3
	Supply Air DB	51.5	65.9	51.7	67.9	52.0	69.8	52.3	71.9	52.7	73.9	53.2	76.0	53.8	78.0	54.4	80.1	55.1	82.2
	Supply Air WB	50.4	54.8	50.7	55.7	50.9	56.7	51.3	57.7	51.7	58.7	52.2	59.8	52.6	60.8	53.1	61.9	53.7	63.0
	Suction PSIG[4]	127	117	129	118	130	119	132	121	134	123	135	125	136	127	136	130	137	133
	Discharge PSIG[4]	287	237	307	254	328	269	349	288	373	304	397	320	424	336	451	351	480	366
75/64.1 (55% RH)	Total Cooling Btuh	54,400	28,000	53,400	25,000	52,200	21,800	50,800	18,600	49,300	15,200	47,500	11,700	45,500	8,100	43,300	4,400	41,000	600
	Sensible Btuh	37,500	9,700	37,000	7,400	36,500	5,000	35,900	2,600	35,200	100	34,400	(2,400)	33,600	(4,900)	32,600	(7,400)	31,600	(10,000)
	S/T	0.689	0.35	0.693	0.30	0.699	0.23	0.707	0.14	0.714	0.01	0.724	0	0.738	0	0.753	0	0.771	0
	Latent Btuh	16,900	18,300	16,400	17,600	15,700	16,800	14,900	16,000	14,100	15,100	13,100	14,100	11,900	13,000	10,700	11,800	9,400	10,600
	Lbs. H20/hr.	15.9	17.3	15.5	16.6	14.8	15.8	14.1	15.1	13.3	14.2	12.4	13.3	11.2	12.3	10.1	11.1	8.9	10.0
	Supply Air DB	52.9	67.0	53.1	68.9	53.4	70.9	53.7	73.0	54.2	75.0	54.6	77.0	55.2	79.1	55.8	81.2	56.5	83.3
	Supply Air WB	51.9	55.9	52.2	56.8	52.5	57.8	52.9	58.8	53.2	59.8	53.7	60.9	54.1	61.9	54.7	63.0	55.2	64.1
	Suction PSIG[4]	130	120	132	121	134	122	135	124	137	126	138	128	139	130	139	133	140	136
	Discharge PSIG[4]	289	239	308	257	329	274	351	291	374	307	399	323	425	338	452	354	481	368
75/65.5 (60% RH)	Total Cooling Btuh	55,600	29,600	54,700	26,500	53,300	23,200	52,100	20,100	50,500	16,800	48,800	13,300	46,800	9,700	44,600	6,000	42,300	2,200
	Sensible Btuh	35,200	8,400	34,700	6,100	34,500	3,700	33,600	1,300	32,900	(1,200)	32,100	(3,700)	31,200	(6,200)	30,300	(8,700)	29,300	(11,300)
	S/T	0.633	0.284	0.634	0.230	0.647	0.159	0.645	0.065	0.651	0	0.658	0	0.667	0	0.679	0	0.693	0
	Latent Btuh	20,400	21,200	20,000	20,400	18,800	19,500	18,500	18,800	17,600	18,000	16,700	17,000	15,600	15,900	14,300	14,700	13,000	13,500
	Lbs. H20/hr.	19.2	20.0	18.9	19.2	17.7	18.4	17.5	17.7	16.6	17.0	15.8	16.0	14.7	15.0	13.5	13.9	12.3	12.7
	Supply Air DB	54.3	68.0	54.5	70.0	54.8	72.0	55.2	74.0	55.6	76.1	56.1	78.1	56.6	80.2	57.2	82.2	57.9	84.3
	Supply Air WB	53.4	57.0	53.7	57.9	53.9	58.9	54.4	59.9	54.8	60.9	55.2	62.0	55.7	63.0	56.2	64.1	56.7	65.2
	Suction PSIG[4]	133	123	135	124	137	125	138	127	140	129	141	131	142	134	142	136	143	139
	Discharge PSIG[4]	290	242	309	259	331	274	352	293	375	309	400	325	426	341	454	356	483	371
75/66.7 (65% RH)	Total Cooling Btuh	56,900	31,200	56,000	28,100	54,600	24,800	53,400	21,700	51,800	18,400	50,100	14,900	48,100	11,300	45,900	7,600	43,500	3,800
	Sensible Btuh	32,800	7,100	32,400	4,800	32,200	2,400	31,200	(100)	30,500	(2,500)	29,800	(5,000)	28,900	(7,500)	28,000	(10,000)	27,000	(12,600)
	S/T	0.576	0.23	0.579	0.17	0.590	0.10	0.584	0	0.589	0	0.595	0	0.601	0	0.610	0	0.621	0
	Latent Btuh	24,100	24,100	23,600	23,300	22,400	22,400	22,200	21,800	21,300	20,900	20,300	19,900	19,200	18,800	17,900	17,600	16,500	16,400
	Lbs. H20/hr.	22.7	22.7	22.3	22.0	21.1	21.1	20.9	20.6	20.1	19.7	19.2	18.8	18.1	17.7	16.9	16.6	15.6	15.5
	Supply Air DB	55.8	69.1	56.0	71.1	56.2	73.0	56.6	75.1	57.0	77.1	57.5	79.2	58.0	81.2	58.6	83.3	59.3	85.4
	Supply Air WB	54.9	58.0	55.2	59.0	55.4	60.0	55.9	61.0	56.3	62.0	56.7	63.0	57.2	64.1	57.7	65.2	58.2	66.3
	Suction PSIG[4]	136	126	138	127	140	129	141	130	143	132	144	134	145	137	145	139	146	142
	Discharge PSIG[4]	291	244	311	262	332	276	353	296	377	312	402	328	428	343	455	359	484	373
75/68 (70% RH)	Total Cooling Btuh	58,200	32,800	57,200	29,700	55,900	26,400	54,700	23,300	53,100	20,000	51,300	16,500	49,400	12,900	47,200	9,200	44,800	5,300
	Sensible Btuh	30,500	5,800	30,100	3,400	29,900	1,100	28,900	(1,400)	28,200	(3,800)	27,400	(6,300)	26,600	(8,800)	25,700	(11,300)	24,700	(13,900)
	S/T	0.524	0.177	0.526	0.114	0.535	0.042	0.528	0	0.531	0	0.534	0	0.538	0	0.544	0	0.551	0
	Latent Btuh	27,700	27,000	27,100	26,300	26,000	25,300	25,800	24,700	24,900	23,800	23,900	22,800	22,800	21,700	21,500	20,500	20,100	19,200
	Lbs. H20/hr.	26.1	25.5	25.6	24.8	24.5	23.9	24.3	23.3	23.5	22.5	22.5	21.5	21.5	20.5	20.3	19.3	19.0	18.1
	Supply Air DB	57.2	70.2	57.4	72.1	57.6	74.1	58.0	76.2	58.4	78.2	58.9	80.2	59.4	82.3	60.1	84.4	60.7	86.5
	Supply Air WB	56.5	59.1	56.7	60.1	57.0	61.1	57.4	62.1	57.8	63.1	58.2	64.1	58.7	65.2	59.2	66.3	59.7	67.4
	Suction PSIG[4]	139	130	141	131	143	132	144	134	146	136	147	138	148	140	148	143	149	146
	Discharge PSIG[4]	293	247	312	264	333	279	355	298	378	314	403	330	429	346	457	361	485	376
80/68.3 (55% RH)	Total Cooling Btuh	58,200	33,300	57,300	30,200	55,900	26,900	54,700	23,800	53,100	20,500	51,400	17,000	49,400	13,400	47,200	9,700	44,800	5,800
	Sensible Btuh	37,900	11,200	37,500	8,800	37,300	6,500	36,300	4,000	35,600	1,600	34,900	(900)	34,000	(3,400)	33,100	(5,900)	32,100	(8,500)
	S/T	0.651	0.34	0.654	0.29	0.667	0.24	0.664	0.17	0.670	0.08	0.679	0	0.688	0	0.701	0	0.717	0
	Latent Btuh	20,300	22,100	19,800	21,400	18,600	20,400	18,400	19,800	17,500	18,900	16,500	17,900	15,400	16,800	14,100	15,600	12,700	14,300
	Lbs. H20/hr.	19.2	20.8	18.7	20.2	17.5	19.2	17.4	18.7	16.5	17.8	15.6	16.9	14.5	15.8	13.3	14.7	12.0	13.5
	Supply Air DB	57.5	70.5	57.7	72.5	58.0	74.4	58.3	76.5	58.8	78.5	59.2	80.6	59.8	82.7	60.4	84.7	61.1	86.8
	Supply Air WB	56.5	59.1	56.8	60.1	57.0	61.1	57.4	62.1	57.8	63.1	58.3	64.1	58.7	65.2	59.2	66.3	59.8	67.4
	Suction PSIG[4]	139	130	142	131	143	133	145	134	146	136	147	138	148	141	149	143	149	146
	Discharge PSIG[4]	288	241	307	258	329	272	350	292	373	308	398	324	424	340	452	355	481	370

[1] Values listed are with ventilation package disabled

[2] Return air temperature °F @ Default airflow (1550 CFM) for AC tests and Balanced Climate airflow (1090 CFM) for dehumidification tests

[3] Below 50°F, unit requires a factory or field installed low ambient control.

[4] Suction pressure +/- 4 psi, Discharge pressure +/- 10 psi

W60ACD Cooling and Dehumidification Application Data[1]

DB/WB[2]	OD Temp.	65°F[3]		70°F		75°F		80°F		85°F		90°F		95°F		100°F		105°F	
	Mode	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum
75/62.5 (50% RH)	Total Cooling Btuh	65,400	31,900	63,800	28,500	62,100	24,700	60,500	21,600	58,800	18,000	57,000	14,300	55,200	10,500	53,300	6,600	51,400	2,600
	Sensible Btuh	47,600	13,600	46,900	11,200	46,200	8,700	45,400	6,400	44,700	3,800	43,900	1,300	43,100	(1,300)	42,300	(4,000)	41,500	(6,700)
	S/T	0.728	0.426	0.735	0.393	0.744	0.352	0.750	0.296	0.760	0.211	0.770	0.091	0.781	0	0.794	0	0.807	0
	Latent Btuh	17,800	18,300	16,900	17,300	15,900	16,000	15,100	15,200	14,100	14,200	13,100	13,000	12,100	11,800	11,000	10,600	9,900	9,300
	Lbs. H20/hr.	16.8	17.3	15.9	16.3	15.0	15.1	14.2	14.3	13.3	13.4	12.4	12.3	11.4	11.1	10.4	10.0	9.3	8.8
	Supply Air DB	50.3	65.2	50.7	66.9	51.0	68.7	51.4	70.4	51.8	72.3	52.2	74.1	52.6	76.1	53.0	78.0	53.4	80.0
	Supply Air WB	49.4	54.2	49.7	55.1	50.0	56.0	50.4	57.0	50.8	58.0	51.2	58.9	51.5	59.9	51.9	60.9	52.3	61.9
	Suction PSIG[4]	126	118	127	119	127	120	128	122	130	123	131	124	132	125	133	127	135	128
	Discharge PSIG[4]	296	278	316	291	339	305	359	318	382	333	405	348	430	364	455	381	481	398
75/64.1 (55% RH)	Total Cooling Btuh	66,800	33,600	65,200	30,300	63,600	26,800	61,900	23,300	60,200	19,700	58,400	16,000	56,600	12,200	54,700	8,300	52,800	4,400
	Sensible Btuh	45,000	12,000	44,300	9,600	43,500	7,200	42,800	4,700	42,000	2,200	41,200	(300)	40,400	(3,000)	39,600	(5,600)	38,800	(8,400)
	S/T	0.674	0.36	0.679	0.32	0.684	0.27	0.691	0.20	0.698	0.11	0.705	0	0.714	0	0.724	0	0.735	0
	Latent Btuh	21,800	21,600	20,900	20,700	20,100	19,600	19,100	18,600	18,200	17,500	17,200	16,300	16,200	15,200	15,100	13,900	14,000	12,800
	Lbs. H20/hr.	20.6	20.4	19.7	19.5	19.0	18.5	18.0	17.5	17.2	16.5	16.2	15.4	15.3	14.3	14.2	13.1	13.2	12.1
	Supply Air DB	51.7	66.3	52.0	68.1	52.4	69.8	52.8	71.6	53.1	73.4	53.5	75.3	53.9	77.2	54.3	79.2	54.7	81.2
	Supply Air WB	50.9	55.3	51.2	56.3	51.5	57.2	51.9	58.1	52.3	59.1	52.6	60.1	53.0	61.0	53.4	62.0	53.8	63.1
	Suction PSIG[4]	129	121	130	122	131	124	132	125	133	126	134	127	135	129	137	130	138	132
	Discharge PSIG[4]	298	282	318	295	340	308	362	322	384	337	408	352	432	368	458	385	484	402
75/65.5 (60% RH)	Total Cooling Btuh	68,200	35,300	66,600	32,000	65,000	28,100	63,300	25,000	61,600	21,400	59,800	17,700	58,000	13,900	56,100	10,100	54,200	6,100
	Sensible Btuh	42,300	10,300	41,600	8,000	40,900	5,400	40,100	3,100	39,400	600	38,600	(2,000)	37,800	(4,600)	37,000	(7,300)	36,100	(10,000)
	S/T	0.620	0.292	0.625	0.250	0.629	0.192	0.633	0.124	0.640	0.028	0.645	0	0.652	0	0.660	0	0.666	0
	Latent Btuh	25,900	25,000	25,000	24,000	24,100	22,700	23,200	21,900	22,200	20,800	21,200	19,700	20,200	18,500	19,100	17,400	18,100	16,100
	Lbs. H20/hr.	24.4	23.6	23.6	22.6	22.7	21.4	21.9	20.7	20.9	19.6	20.0	18.6	19.1	17.5	18.0	16.4	17.1	15.2
	Supply Air DB	53.0	67.5	53.4	69.2	53.7	71.0	54.1	72.8	54.5	74.6	54.9	76.5	55.3	78.4	55.7	80.3	56.1	82.3
	Supply Air WB	52.3	56.5	52.7	57.4	52.9	58.3	53.4	59.3	53.7	60.2	54.1	61.2	54.5	62.2	54.9	63.2	55.3	64.2
	Suction PSIG[4]	132	125	133	126	134	127	135	128	136	129	137	131	139	132	140	133	141	135
	Discharge PSIG[4]	301	286	321	299	344	313	364	326	387	341	410	356	435	372	460	389	486	406
75/66.7 (65% RH)	Total Cooling Btuh	69,600	37,100	68,000	33,700	66,400	29,900	64,700	26,800	63,000	23,100	61,200	19,400	59,400	15,700	57,600	11,800	55,600	7,800
	Sensible Btuh	39,700	8,700	38,900	6,400	38,200	3,800	37,500	1,500	36,700	(1,000)	35,900	(3,600)	35,100	(6,200)	34,300	(8,900)	33,500	(11,600)
	S/T	0.570	0.23	0.572	0.19	0.575	0.13	0.580	0.06	0.583	0	0.587	0	0.591	0	0.595	0	0.603	0
	Latent Btuh	29,900	28,400	29,100	27,300	28,200	26,100	27,200	25,300	26,300	24,100	25,300	23,000	24,300	21,900	23,300	20,700	22,100	19,400
	Lbs. H20/hr.	28.2	26.8	27.5	25.8	26.6	24.6	25.7	23.9	24.8	22.7	23.9	21.7	22.9	20.7	22.0	19.5	20.8	18.3
	Supply Air DB	54.4	68.7	54.7	70.4	55.1	72.2	55.5	73.9	55.9	75.7	56.2	77.6	56.6	79.5	57.1	81.5	57.5	83.5
	Supply Air WB	53.8	57.6	54.1	58.5	54.4	59.4	54.8	60.4	55.2	61.4	55.5	62.3	55.9	63.3	56.3	64.3	56.7	65.3
	Suction PSIG[4]	136	128	137	129	138	130	139	131	140	133	141	134	142	135	143	137	145	138
	Discharge PSIG[4]	303	290	324	303	347	317	367	330	389	345	413	360	437	376	463	393	489	410
75/68 (70% RH)	Total Cooling Btuh	71,000	38,800	69,400	35,500	67,800	31,600	66,100	28,500	64,400	24,900	62,700	21,200	60,800	17,400	59,000	13,500	57,100	9,600
	Sensible Btuh	37,000	7,100	36,300	4,700	35,600	2,200	34,800	(100)	34,000	(2,600)	33,300	(5,200)	32,500	(7,800)	31,600	(10,500)	30,800	(13,200)
	S/T	0.521	0.183	0.523	0.132	0.525	0.070	0.526	0	0.528	0	0.531	0	0.535	0	0.536	0	0.539	0
	Latent Btuh	34,000	31,700	33,100	30,800	32,200	29,400	31,300	28,600	30,400	27,500	29,400	26,400	28,300	25,200	27,400	24,000	26,300	22,800
	Lbs. H20/hr.	32.1	29.9	31.2	29.1	30.4	27.7	29.5	27.0	28.7	25.9	27.7	24.9	26.7	23.8	25.8	22.6	24.8	21.5
	Supply Air DB	55.8	69.8	56.1	71.5	56.5	73.3	56.8	75.1	57.2	76.9	57.6	78.8	58.0	80.7	58.4	82.7	58.8	84.6
	Supply Air WB	55.2	58.7	55.6	59.6	55.8	60.6	56.3	61.5	56.6	62.5	57.0	63.5	57.4	64.4	57.8	65.4	58.2	66.5
	Suction PSIG[4]	139	131	140	132	141	134	142	135	143	136	144	137	146	139	147	140	148	142
	Discharge PSIG[4]	306	294	326	307	349	321	369	334	392	349	416	364	440	380	465	397	491	414
80/68.3 (55% RH)	Total Cooling Btuh	71,400	39,200	69,900	35,900	68,200	32,000	66,600	28,900	64,800	25,300	63,100	21,600	61,300	17,800	59,400	14,000	57,500	10,000
	Sensible Btuh	45,800	13,600	45,100	11,200	44,400	8,700	43,600	6,400	42,800	3,800	42,000	1,300	41,200	(1,300)	40,400	(4,000)	39,600	(6,700)
	S/T	0.641	0.35	0.645	0.31	0.651	0.27	0.655	0.22	0.660	0.15	0.666	0.06	0.672	0	0.680	0	0.689	0
	Latent Btuh	25,600	25,600	24,800	24,700	23,800	23,300	23,000	22,500	22,000	21,500	21,100	20,300	20,100	19,100	19,000	18,000	17,900	16,700
	Lbs. H20/hr.	24.2	24.2	24.4	24.2	23.4	23.3	22.5	22.0	21.7	21.2	20.8	20.3	19.9	19.2	19.0	18.0	17.9	17.0	16.9	15.8
	Supply Air DB	56.1	70.2	56.5	71.9	56.8	73.7	57.2	75.5	57.6	77.3	58.0	79.2	58.4	81.1	58.8	83.1	59.2	85.1
	Supply Air WB	55.4	58.9	55.7	59.9	56.0	60.8	56.4	61.7	56.8	62.7	57.2	63.7	57.5	64.7	57.9	65.7	58.3	66.7
	Suction PSIG[4]	140	132	141	133	142	134	143	135	144	137	145	138	146	139	148	141	149	142
	Discharge PSIG[4]	305	295	325	308	348	322	368	336	391	350	415	366	439	381	464	398	490	415

[1] Values listed are with ventilation package disabled

[2] Return air temperature °F @ Default airflow (1750 CFM) for AC tests and Balanced Climate airflow (1180 CFM) for dehumidification tests

[3] Below 50°F, unit requires a factory or field installed low ambient control.

[4] Suction pressure +/- 4 psi, Discharge pressure +/- 10 psi

W72ACD Cooling and Dehumidification Application Data[1]

DB/WB[2]	OD Temp.	65°F[3]		70°F		75°F		80°F		85°F		90°F		95°F		100°F		105°F	
	Mode	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum
75/62.5 (50% RH)	Total Cooling Btuh	79,000	38,500	77,000	35,000	75,200	31,700	73,100	27,700	71,000	23,800	69,000	19,800	67,000	15,700	64,900	11,400	62,800	6,900
	Sensible Btuh	55,100	15,100	54,100	12,400	53,200	9,800	52,200	6,900	51,200	4,100	50,300	1,200	49,400	(1,700)	48,500	(4,700)	47,700	(7,700)
	S/T	0.697	0.392	0.703	0.354	0.707	0.309	0.714	0.249	0.721	0.172	0.729	0.061	0.737	0	0.747	0	0.760	0
	Latent Btuh	23,900	23,400	22,900	22,600	22,000	21,900	20,900	20,800	19,800	19,700	18,700	18,600	17,600	17,400	16,400	16,100	15,100	14,600
	Lbs. H20/hr.	22.5	22.1	21.6	21.3	20.8	20.7	19.7	19.6	18.7	18.6	17.6	17.5	16.6	16.4	15.5	15.2	14.2	13.8
	Supply Air DB	48.5	64.9	48.9	66.7	49.4	68.3	49.8	70.3	50.3	72.2	50.7	74.2	51.1	76.1	51.6	78.1	52.0	80.2
	Supply Air WB	47.6	53.1	48.1	54.0	48.5	54.9	48.9	56.0	49.4	57.0	49.8	58.0	50.2	59.0	50.6	60.0	50.9	61.1
	Suction PSIG[4]	117	109	119	111	120	112	121	113	122	115	124	116	125	117	126	119	127	120
	Discharge PSIG[4]	301	300	321	313	342	326	365	341	389	356	413	372	439	389	466	406	494	425
75/64.1 (55% RH)	Total Cooling Btuh	80,800	40,600	78,900	37,200	76,900	33,600	74,900	29,800	72,900	26,000	70,900	21,900	68,800	17,800	66,700	13,500	64,600	9,000
	Sensible Btuh	52,200	13,200	51,200	10,600	50,200	7,800	49,200	5,100	48,300	2,300	47,400	(600)	46,500	(3,500)	45,600	(6,500)	44,700	(9,500)
	S/T	0.646	0.33	0.649	0.28	0.653	0.23	0.657	0.17	0.663	0.09	0.669	0	0.676	0	0.684	0	0.692	0
	Latent Btuh	28,600	27,400	27,700	26,600	26,700	25,800	25,700	24,700	24,600	23,700	23,500	22,500	22,300	21,300	21,100	20,000	19,900	18,500
	Lbs. H20/hr.	27.0	25.8	26.1	25.1	25.2	24.3	24.2	23.3	23.2	22.4	22.2	21.2	21.0	20.1	19.9	18.9	18.8	17.5
	Supply Air DB	49.9	66.2	50.4	67.9	50.8	69.7	51.3	71.6	51.7	73.5	52.1	75.4	52.6	77.3	53.0	79.4	53.4	81.4
	Supply Air WB	49.1	54.2	49.6	55.1	50.0	56.1	50.4	57.0	50.9	58.0	51.3	59.0	51.7	60.1	52.1	61.1	52.4	62.2
	Suction PSIG[4]	120	112	122	114	123	115	124	116	125	118	127	119	128	120	129	122	130	123
	Discharge PSIG[4]	304	305	324	317	346	331	368	345	392	361	416	377	442	394	469	411	497	430
75/65.5 (60% RH)	Total Cooling Btuh	82,700	42,700	80,700	39,300	78,900	36,000	76,700	32,000	74,700	28,100	72,700	24,100	70,600	19,900	68,600	15,600	66,500	11,200
	Sensible Btuh	49,300	11,400	48,200	8,700	47,300	6,200	46,300	3,300	45,400	400	44,400	(2,400)	43,500	(5,400)	42,700	(8,300)	41,800	(11,300)
	S/T	0.596	0.267	0.597	0.221	0.599	0.172	0.604	0.103	0.608	0.014	0.611	0	0.616	0	0.622	0	0.629	0
	Latent Btuh	33,400	31,300	32,500	30,600	31,600	29,800	30,400	28,700	29,300	27,700	28,300	26,500	27,100	25,300	25,900	23,900	24,700	22,500
	Lbs. H20/hr.	31.5	29.5	30.7	28.9	29.8	28.1	28.7	27.1	27.6	26.1	26.7	25.0	25.6	23.9	24.4	22.5	23.3	21.2
	Supply Air DB	51.3	67.4	51.8	69.2	52.2	70.8	52.7	72.8	53.1	74.7	53.6	76.6	54.0	78.6	54.4	80.6	54.8	82.6
	Supply Air WB	50.6	55.2	51.1	56.2	51.5	57.1	51.9	58.1	52.3	59.1	52.8	60.1	53.2	61.2	53.5	62.2	53.9	63.3
	Suction PSIG[4]	124	115	125	117	126	118	127	119	129	121	130	122	131	123	132	125	133	126
	Discharge PSIG[4]	307	309	327	322	349	335	371	350	395	365	420	381	445	398	472	416	500	434
75/66.7 (65% RH)	Total Cooling Btuh	84,500	44,800	82,600	41,400	80,700	38,100	78,600	34,100	76,600	30,200	74,500	26,200	72,500	22,000	70,400	17,700	68,300	13,300
	Sensible Btuh	46,300	9,600	45,300	6,900	44,400	4,400	43,400	1,400	42,400	(1,400)	41,500	(4,300)	40,600	(7,200)	39,700	(10,100)	38,900	(13,200)
	S/T	0.548	0.21	0.548	0.17	0.550	0.12	0.552	0.04	0.554	0	0.557	0	0.560	0	0.564	0	0.570	0
	Latent Btuh	38,200	35,200	37,300	34,500	36,300	33,700	35,200	32,700	34,200	31,600	33,000	30,500	31,900	29,200	30,700	27,800	29,400	26,500
	Lbs. H20/hr.	36.0	33.2	35.2	32.5	34.2	31.8	33.2	30.8	32.3	29.8	31.1	28.8	30.1	27.5	29.0	26.2	27.7	25.0
	Supply Air DB	52.7	68.6	53.2	70.4	53.6	72.0	54.1	74.0	54.5	75.9	55.0	77.8	55.4	79.8	55.8	81.8	56.2	83.9
	Supply Air WB	52.1	56.3	52.5	57.3	53.0	58.2	53.4	59.2	53.8	60.2	54.2	61.2	54.6	62.2	55.0	63.3	55.4	64.3
	Suction PSIG[4]	127	118	128	120	129	121	131	122	132	123	133	125	134	126	135	128	136	129
	Discharge PSIG[4]	310	314	331	327	352	340	375	355	398	370	423	386	448	403	475	421	503	439
75/68 (70% RH)	Total Cooling Btuh	86,400	47,000	84,400	43,500	82,600	40,200	80,400	36,200	78,400	32,300	76,400	28,300	74,300	24,200	72,200	19,900	70,100	15,400
	Sensible Btuh	43,400	7,800	42,400	5,100	41,500	2,500	40,400	(400)	39,500	(3,200)	38,600	(6,100)	37,700	(9,000)	36,800	(12,000)	36,000	(15,000)
	S/T	0.502	0.166	0.502	0.117	0.502	0.062	0.502	0	0.504	0	0.505	0	0.507	0	0.510	0	0.514	0
	Latent Btuh	43,000	39,200	42,000	38,400	41,100	37,700	40,000	36,600	38,900	35,500	37,800	34,400	36,600	33,200	35,400	31,900	34,100	30,400
	Lbs. H20/hr.	40.6	37.0	39.6	36.2	38.8	35.6	37.7	34.5	36.7	33.5	35.7	32.5	34.5	31.3	33.4	30.1	32.2	28.7
	Supply Air DB	54.2	69.8	54.6	71.6	55.1	73.3	55.5	75.3	56.0	77.2	56.4	79.1	56.8	81.0	57.2	83.0	57.6	85.1
	Supply Air WB	53.6	57.4	54.0	58.4	54.5	59.2	54.9	60.3	55.3	61.3	55.7	62.3	56.1	63.3	56.5	64.4	56.9	65.4
	Suction PSIG[4]	130	121	131	123	132	124	134	125	135	126	136	128	137	129	138	131	140	132
	Discharge PSIG[4]	313	319	334	332	355	344	378	360	401	375	426	391	452	408	478	425	506	444
80/68.3 (55% RH)	Total Cooling Btuh	86,500	46,800	84,600	43,300	82,700	40,000	80,600	36,000	78,600	32,100	76,500	28,100	74,500	23,900	72,400	19,600	70,300	15,200
	Sensible Btuh	53,200	14,300	52,200	11,700	51,300	9,100	50,300	6,200	49,300	3,300	48,400	500	47,500	(2,400)	46,700	(5,400)	45,800	(8,400)
	S/T	0.615	0.31	0.617	0.27	0.620	0.23	0.624	0.17	0.627	0.10	0.633	0.02	0.638	0	0.645	0	0.651	0
	Latent Btuh	33,300	32,500	32,400	31,600	31,400	30,900	30,300	29,800	29,300	28,800	28,100	27,600	27,000	26,300	25,700	25,000	24,500	23,600
	Lbs. H20/hr.	31.4	30.7	30.6	29.8	29.6	29.2	28.6	28.1	27.6	27.2	26.5	26.0	25.5	24.8	24.2	23.6	23.1	22.3
	Supply Air DB	54.3	70.4	54.8	72.2	55.3	73.8	55.7	75.8	56.2	77.7	56.6	79.6	57.0	81.6	57.4	83.6	57.8	85.6
	Supply Air WB	53.5	57.6	54.0	58.6	54.4	59.5	54.8	60.5	55.3	61.5	55.7	62.5	56.1	63.6	56.5	64.6	56.8	65.6
	Suction PSIG[4]	131	122	132	123	133	124	135	126	136	127	137	128	138	130	139	131	140	133
	Discharge PSIG[4]	314	321	334	334	356	346	378	362	402	377	426	393	452	410	479	427	507	446

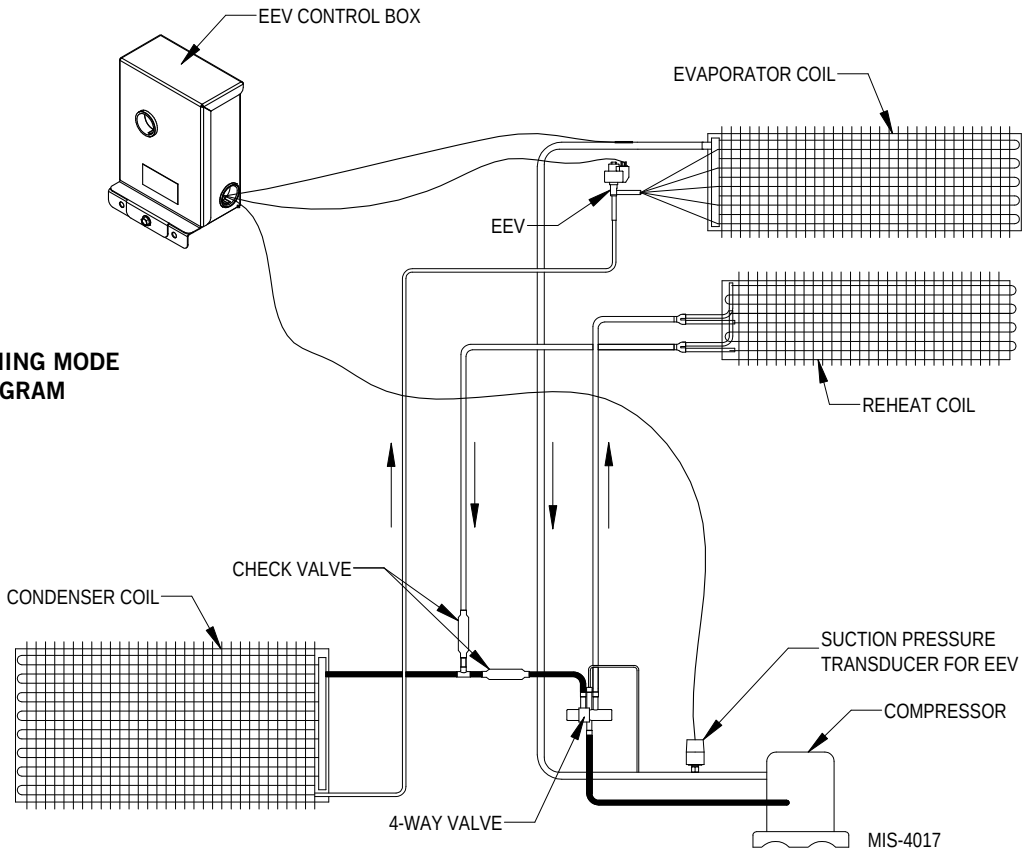
[1] Values listed are with ventilation package disabled

[2] Return air temperature °F @ Default airflow (1900 CFM) for AC tests and Balanced Climate airflow (1330 CFM) for dehumidification tests

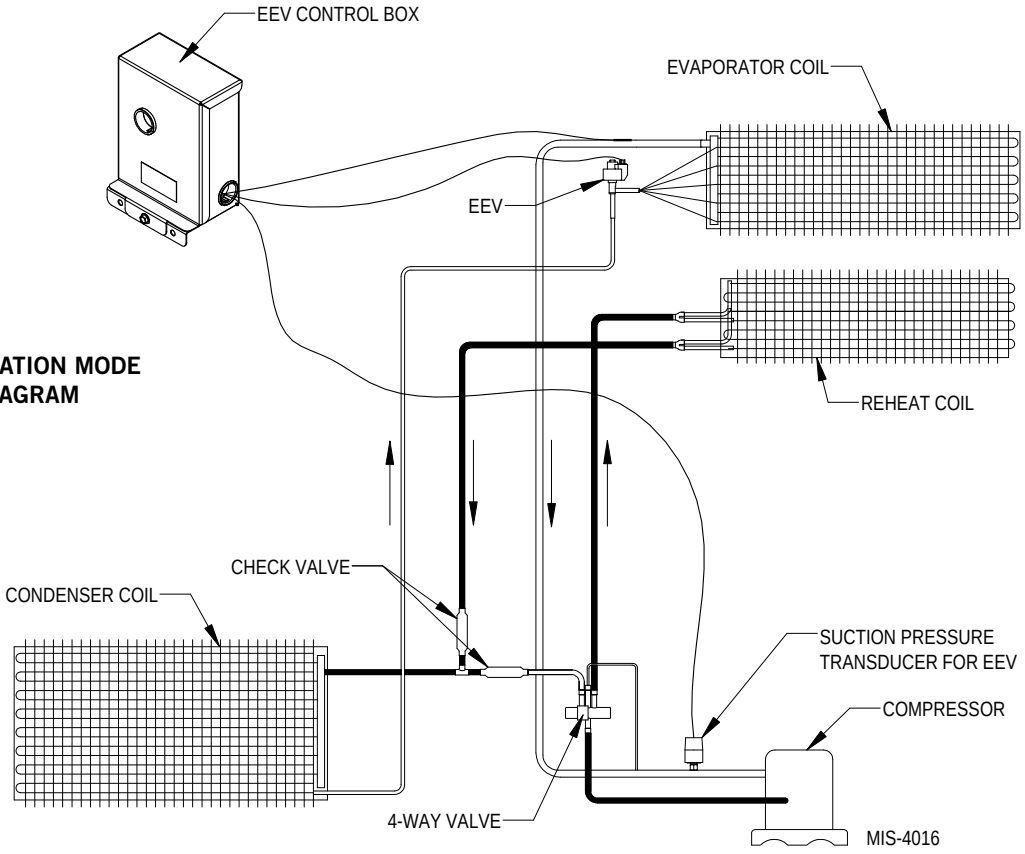
[3] Below 50°F, unit requires a factory or field installed low ambient control.

[4] Suction pressure +/- 4 psi, Discharge pressure +/- 10 psi

AIR CONDITIONING MODE CIRCUIT DIAGRAM



DEHUMIDIFICATION MODE CIRCUIT DIAGRAM



DEHUMIDIFICATION RELAY LOGIC BOARD

24V Terminal Block Connections		G	Y1	D	W1	A	W2	Outputs From Board		
Inputs to Board		G	Y	D	W2	A1		G1	TWV	YO
Cooling Mode	Unoccupied		X							X
Cooling Mode	Occupied		X			X				X
Cooling Mode ①	w / Dehum		X	X						X
1st Stage Heating	Unoccupied				X					
1st Stage Heating	Occupied				X	X				
1st Stage Heating	w / Dehum			X					X	X
2nd Stage Heating	Unoccupied				X		X			
2nd Stage Heating	Occupied				X	X	X			
2nd Stage Heating	w / Dehum			X	X		X		X	X
Dehumidification	Unoccupied			X					X ②	X ②
Dehumidification	Occupied			X		X			X	X

① Cooling takes precedence over dehumidification. A cooling call cancels dehumidification.

② The relay logic board has a jumper (J1) on it to choose between “any-time dehumidification” and “occupied dehumidification”. The factory default is P1-P2. With the jumper in the P1-P2 position, dehumidification is available any time there is a “D” input to the relay logic board. With the jumper in the P2-P3 position, dehumidification is available when there is an occupancy signal to the “A1” terminal, “D” would also need to be energized to dehumidify.

Refer to sequence of operation. In most cases cooling and heating modes take priority over dehumidification.

Electrical Specifications

Model	Rated Volts & Phase	No. Field Power Circuits	Single Circuit				Dual Circuit							
			① Minimum Circuit Ampacity	② Maximum External Fuse or Ckt. Brkr.	③ Field Power Wire Size	③ Ground Wire	① Minimum Circuit Ampacity		② Maximum External Fuse or Ckt. Breaker		③ Field Power Wire Size		③ Ground Wire Size	
							Ckt. A	Ckt. B	Ckt. A	Ckt. B	Ckt. A	Ckt. B	Ckt. A	Ckt. B
W30ABDA00,A0Z	230/208-1	1	23	35	8	10								
A05		1	31	35	8	10								
A08		1	46	50	8	10								
A10		1	57	60	6	10								
W30ABDB00,B0Z	230/208-3	1	17	20	12	12								
B06		1	23	25	10	10								
B09		1	32	35	8	10								
W30ABDC00,C0Z	460-3	1	10	15	14	14								
C06		1	13	15	14	14								
C09		1	17	20	12	12								
W36ABDA00,A0Z	230/208-1	1	28	40	8	10								
A05		1	32	40	8	10								
A08		1	48	50	8	10								
A10		1	58	60	6	10								
W36ABDB00,B0Z	230/208-3	1	20	25	10	10								
B06		1	24	25	10	10								
B09		1	33	35	8	10								
W36ABDC00,C0Z	460-3	1	13	15	14	14								
C06		1	14	15	14	14								
C09		1	18	20	12	12								
W42ACDA00,A0Z	230/208-1	1	31	40	8	10								
A05		1	31	40	8	10								
A10		1	57	60	6	10								
A15		1 or 2	83	90	4	8	57	26	60	30	6	10	10	10
W42ACDB00,B0Z	230/208-3	1	23	35	8	10								
B05		1	23	35	8	10								
B09		1	33	35	8	10								
B18		1	60	60	6	10								
W42ACDC00,C0Z	460-3	1	13	15	14	14								
C05		1	13	15	14	14								
C09		1	18	20	12	12								
W48ACDA00,A0Z	230/208-1	1	34	50	8	10								
A05		1	34	50	8	10								
A10		1	59	60	6	10								
A15		1 or 2	85	90	4	8	59	26	60	30	6	10	10	10
W48ACDB00,B0Z	230/208-3	1	25	30	8	10								
B05		1	25	30	8	10								
B09		1	34	40	8	10								
B18		1	60	60	6	10								
W48ACDC00,C0Z	460-3	1	12	15	14	14								
C05		1	12	20	12	12								
C09		1	17	20	10	10								
W60ACDA00,A0Z	230/208-1	1	41	50	8	10								
A05		1	41	50	8	10								
A10		1	59	60	6	10								
W60ACDB00,B0Z	230/208-3	1	28	40	8	10								
B09		1	35	40	8	10								
B15		1	53	60	6	10								
W60ACDC00,C0Z	460-3	1	15	20	12	12								
C09		1	18	20	12	12								
C15		1	27	30	10	10								
W72ACDA00,A0Z	230/208-1	1	56	60	6	10								
A05		1	56	60	6	10								
A10		1 or 2	60	70	4	10	59	26	60	30	6	10	10	10
A15		1 or 2	86	90	3	8	59	52	60	60	6	6	10	10
W72ACDB00,B0Z	230/208-3	1	36	45	8	10								
B06		1	36	45	8	10								
B09		1	36	45	8	10								
B15		1	51	60	6	10								
W72ACDC00,C0Z	460-3	1	19	25	10	10								
C09		1	19	25	10	10								
C15		1	27	30	10	10								

① These "Minimum Circuit Ampacity" values are to be used for sizing the field power conductors. Refer to the National Electrical code (latest version), Article 310 for power conductor sizing.

② Maximum size of the time delay fuse or circuit breaker for protection of field wiring conductors.

③ Based on 75°C copper wire. All wiring must conform to the National Electrical Code and all local codes.

Caution: When more than one field power circuit is run through one conduit, the conductors must be derated. Pay special attention to note 8 of Table 310 regarding Ampacity Adjustment Factors when more than three (3) current carrying conductors are in a raceway.

IMPORTANT: While this electrical data is presented as a guide, it is important to electrically connect properly sized fuses and conductor wires in accordance with the National Electrical Code and all local codes.

Sales Order Transfer Checklist

SD07

Rev X3

Note: If macros are disabled, go to Tools - Macro - Security and choose "Medium", then close and reopen this file and select "Enable" when prompted.

Handoff Date:	SALES REP	
	Ben S	

Upon acceptance of the customer's contract or purchase order, the Project Manager (PM) reviews following checklist with the Sales Manager, the respective Applications Engineer and the Chief Operating Officer to insure that relevant information is transferred.

Customer and Contact Information		Number of Units	All Same Location?	
Name	Instant On LLC	1	Yes	☑
Address	206 W St. #437		No	☐
City/State/ZIP	Santa Ana, CA, 92701			
Phone		Adjust Rows		
E-mail	aj@instanton.energy			

Check "Yes" above if all units at same location, enter location on Row 19, then press button to adjust table below for # of units.

8 characters, e.g. PSEG0512

PO Date	Order Sales Folder Location	Project Code	Standard T's & C's	
	Enter Link Here	INST0720	Yes	☑
			No	☐

End User Data				
Number	Project Location	Customer Contact	Ship Date	Notes
INST0720	N:\Customer Projects\I-J\Instant On LLC\INST0720 - Tennessee			

Supporting Information

Check each item as it is completed

Contract Documents		
☐	Fully Executed PO/ Contract or Other	Enter link here or provide hard copy
☐	Customer Invoicing Data entered?	Enter invoice information
☐	Tax Exempt Certificate	Enter link here or provide hard copy
☐	Insurance Certificate (If necessary)	Enter link here or provide hard copy

Billing Information		
☐	Billing Contact	Miki Domine
☐	E-mail address	miki@instanton.energy
☐	Work Phone	(626) 646-3292
☐	Cell Phone	
☐	Fax Machine	

Field Service and Logistics Documents		
☐	Key contacts (customer, subs, etc.)	Enter link here
☐	Firm Delivery schedule	Firm Fixed delivery day or TBD
☐	Shipping terms	Ex Work Barre or NPS to assist
☐	Installation Scope & site information	Enter link here
☐	Commissioning Scope	Enter link here
☑	Maintenance Provider	Northern Reliability Inc.

Technical Documents		
☐	Site Specific Data (wind, soils, etc)	SD06 Data
☐	Site Review	Completed or pending
☐	NR Pre-order Technical Work	Enter link(s) here to prefeasibility study, SD06, energy estimates, air density calcs, etc….
☐	Electrical One Line	If included in sales process

Sales Order Transfer Checklist

SD07

Rev X3

Note: If macros are disabled, go to Tools - Macro - Security and choose "Medium", then close and reopen this file and select "Enable" when prompted.

Handoff Date:	SALES REP
	Ben S

Upon acceptance of the customer's contract or purchase order, the Project Manager (PM) reviews following checklist with the Sales Manager, the respective Applications Engineer and the Chief Operating Officer to insure that relevant information is transferred.

Customer and Contact Information	
Name	Instant On LLC
Address	206 W St. #437
City/State/ZIP	Santa Ana, CA, 92701
Phone	
E-mail	aj@instanton.energy

Number of Units	All Same Location?	
1	**Yes**	☑
	No	☐

Adjust Rows

Check "Yes" above if all units at same location, enter location on Row 19, then press button to adjust table below for # of units.

8 characters, e.g. PSEG0512

General Assessments		
☐	**Chief risks or concerns**	Enter link here
☐	**Long lead items & production issues**	Enter link here
☐	**Special requirements - i.e. Test & Inspection, codes, certifications**	Enter link here

System Operation		
☐	**Ownerhsip after installation**	Name Address
☐	**Maintenance Provider**	Enter link here
☐	**Other**	Enter link here

Additional Notes
This is for maintenance work on the FAA towers we provided under previous contract.

Sales Order Transfer Checklist

SD07

Rev X4

Note: If macros are disabled, go to Tools - Macro - Security and choose "Medium", then close and reopen this file and select "Enable" when prompted.

Handoff Date:	SALES REP
12/1/2020	Gregg N

Upon acceptance of the customer's contract or purchase order, the Project Manager (PM) reviews following checklist with the Sales Manager, the respective Applications Engineer and the Chief Operating Officer to insure that relevant information is transferred.

Customer and Contact Information		Number of Units	All Same Location?	
Name	Community Development Enterprises - Jackson I, LLC	1	Yes	☑
Address	5548 Trousdale Drive		No	☐
City/State/ZIP	Brentwood, TN 37027			
Phone	1-731-442-4464			
E-mail	de@comdevent.com			

Adjust Rows

Check "Yes" above if all units at same location, enter location on Row 19, then press button to adjust table below for # of units.

8 characters, e.g. PSEG0512

PO Date	Order Sales Folder Location	Project Code	Standard T's & C's	
	Enter Link Here	INST0720	Yes	☑
			No	☐

End User Data				
Number	Project Location	Customer Contact	Ship Date	Notes
INST0720	N:\Customer Projects\I-J\Instant On LLC\INST0720 - Tennessee			

Supporting Information

Check each item as it is completed

Contract Documents		
☑	Fully Executed PO/ Contract or Other	N:\Customer Projects\I-J\Instant On LLC\INST0720 - Tennessee\SD- SALES DOCS\CONTRACTS - Pos
☐	Customer Invoicing Data entered?	Enter invoice information
☐	Tax Exempt Certificate	Enter link here or provide hard copy
☐	Insurance Certificate (If necessary)	Enter link here or provide hard copy

Billing Information		
☐	Billing Contact	Dennis Emberling
☐	E-mail address	de@comdevent.com
☐	Work Phone	1-731-442-4464
☐	Cell Phone	
☐	Fax Machine	

Field Service and Logistics Documents		
☐	Key contacts (customer, subs, etc.)	Enter link here
☐	Firm Delivery schedule	Firm Fixed delivery day or TBD
☐	Shipping terms	Ex Work Barre or NPS to assist
☐	Installation Scope & site information	Enter link here
☐	Commissioning Scope	Enter link here
☑	Maintenance Provider	Northern Reliability Inc.

Technical Documents		
☐	Site Specific Data (wind, soils, etc)	SD06 Data
☐	Site Review	Completed or pending
☐	NR Pre-order Technical Work	Enter link(s) here to prefeasibility study, SD06, energy estimates, air density calcs, etc.…

Sales Order Transfer Checklist

SD07

Rev X4

Note: If macros are disabled, go to Tools - Macro - Security and choose "Medium", then close and reopen this file and select "Enable" when prompted.

Handoff Date:	SALES REP
12/1/2020	Gregg N

Upon acceptance of the customer's contract or purchase order, the Project Manager (PM) reviews following checklist with the Sales Manager, the respective Applications Engineer and the Chief Operating Officer to insure that relevant information is transferred.

Customer and Contact Information		Number of Units	All Same Location?	
Name	Community Development Enterprises - Jackson I, LLC	1	**Yes**	☑
Address	5548 Trousdale Drive		**No**	☐
City/State/ZIP	Brentwood, TN 37027			
Phone	1-731-442-4464			
E-mail	de@comdevent.com			

Adjust Rows

Check "Yes" above if all units at same location, enter location on Row 19, then press button to adjust table below for # of units.

8 characters, e.g. PSEG0512

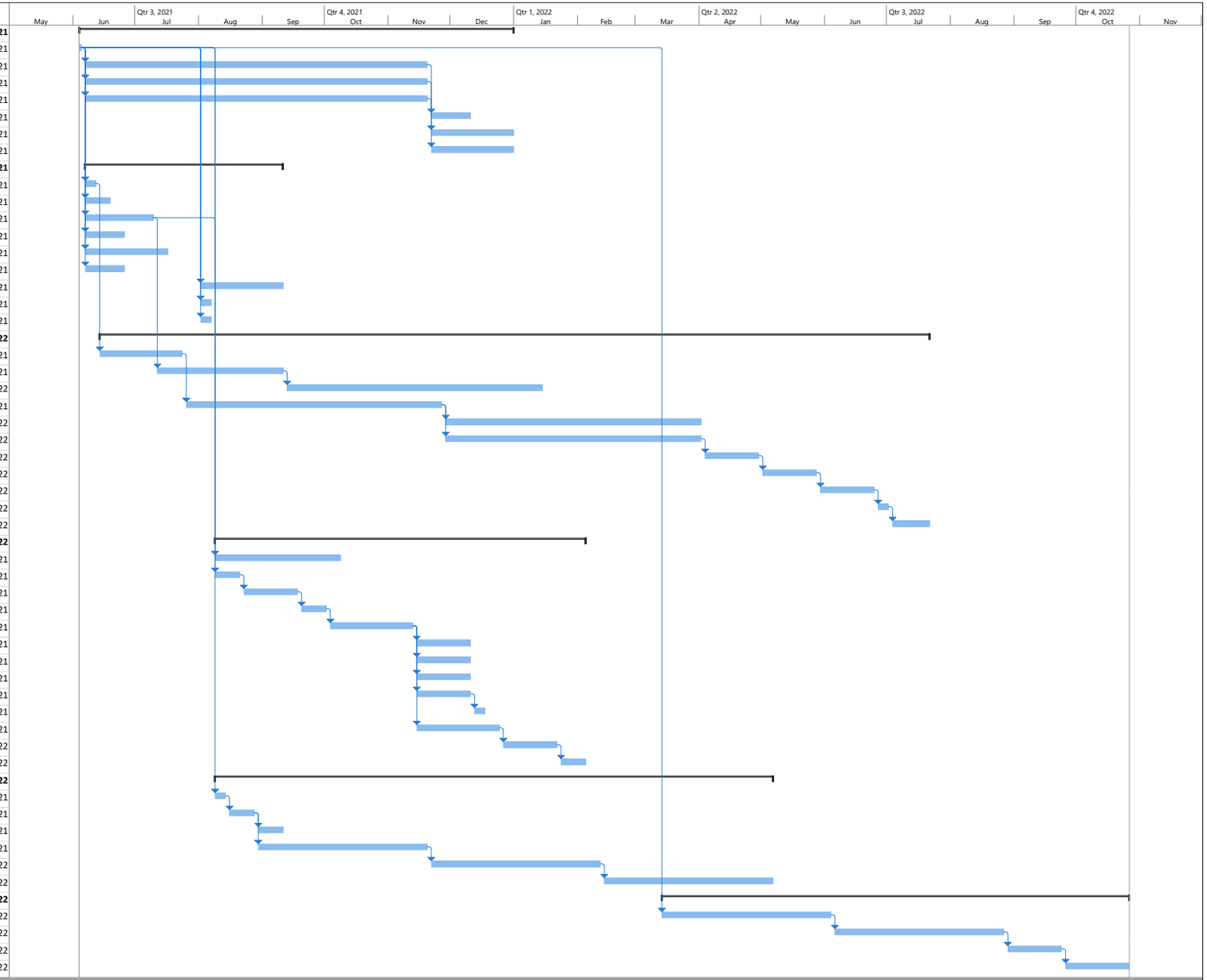
☐	**Electrical One Line**	If included in sales process

General Assessments		
☐	**Chief risks or concerns**	Enter link here
☐	**Long lead items & production issues**	Enter link here
☐	**Special requirements - i.e. Test & Inspection, codes, certifications**	Enter link here

System Operation		
☐	**Ownerhsip after installation**	Name Address
☐	**Maintenance Provider**	Enter link here
☐	**Other**	Enter link here

Additional Notes
This is for maintenance work on the FAA towers we provided under previous contract.

ID	Task Name	Duration	Start	Finish
1	**LNTP**	**151 days**	**Fri 6/4/21**	**Fri 12/31/21**
2	Final customer site listing and MV path selection	1 day	Fri 6/4/21	Fri 6/4/21
3	Procure Inverters	6 mons	Mon 6/7/21	Fri 11/19/21
4	Procure Battery Modules	6 mons	Mon 6/7/21	Fri 11/19/21
5	Procure Transformers	6 mons	Mon 6/7/21	Fri 11/19/21
6	Ship Inverters	3 wks	Mon 11/22/21	Fri 12/10/21
7	Ship Battery Modules	6 wks	Mon 11/22/21	Fri 12/31/21
8	Ship Transformers	6 wks	Mon 11/22/21	Fri 12/31/21
9	**NTP**	**70 days**	**Mon 6/7/21**	**Fri 9/10/21**
10	Contract with iSUN for Solar	1 wk	Mon 6/7/21	Fri 6/11/21
11	Contract with MV vendor	2 wks	Mon 6/7/21	Fri 6/18/21
12	Contract with local civil contractor	5 wks	Mon 6/7/21	Fri 7/9/21
13	Contract with Enclosure Manufacturer	3 wks	Mon 6/7/21	Fri 6/25/21
14	Contract with Microgrid Panel manufacturer	6 wks	Mon 6/7/21	Fri 7/16/21
15	Contract with Survey Sub (by CDE)	3 wks	Mon 6/7/21	Fri 6/25/21
16	Procure System Controller Components	6 wks	Mon 8/2/21	Fri 9/10/21
17	Procure Building Enclosures	1 wk	Mon 8/2/21	Fri 8/6/21
18	Procure Microgrid Panels	1 wk	Mon 8/2/21	Fri 8/6/21
19	**Solar Construction**	**289 days**	**Mon 6/14/21**	**Thu 7/21/22**
20	Site Survey (by Others)	30 days	Mon 6/14/21	Fri 7/23/21
21	Site Civil (by Others)	45 days	Mon 7/12/21	Fri 9/10/21
22	Electrical Trenching	90 days	Mon 9/13/21	Fri 1/14/22
23	RBI Post installation	90 days	Mon 7/26/21	Fri 11/26/21
24	RBI Racking Installation	90 days	Mon 11/29/21	Fri 4/1/22
25	Module Installation	90 days	Mon 11/29/21	Fri 4/1/22
26	Equipment Placement	20 days	Mon 4/4/22	Fri 4/29/22
27	Wire Pull	20 days	Mon 5/2/22	Fri 5/27/22
28	Wire Termination	20 days	Mon 5/30/22	Fri 6/24/22
29	Testing	1 wk	Mon 6/27/22	Fri 7/1/22
30	Commissioning	14 days	Mon 7/4/22	Thu 7/21/22
31	**Battery System Construction**	**130 days**	**Mon 8/9/21**	**Fri 2/4/22**
32	Building Enclosure Permitting	45 days	Mon 8/9/21	Fri 10/8/21
33	Building Pad & Conduit Placement	2 wks	Mon 8/9/21	Fri 8/20/21
34	Building Enclosure Placement	1 mon	Mon 8/23/21	Fri 9/17/21
35	HVAC installation	2 wks	Mon 9/20/21	Fri 10/1/21
36	Racking Installation	6 wks	Mon 10/4/21	Fri 11/12/21
37	Fire Suppression Installation	1 mon	Mon 11/15/21	Fri 12/10/21
38	DCA Installation	1 mon	Mon 11/15/21	Fri 12/10/21
39	SC Controller Installation	1 mon	Mon 11/15/21	Fri 12/10/21
40	Inverter Installation	1 mon	Mon 11/15/21	Fri 12/10/21
41	DCA to Inverter Wiring	1 wk	Mon 12/13/21	Fri 12/17/21
42	Battery module installation and bussing	6 wks	Mon 11/15/21	Fri 12/24/21
43	Transformer Installation	1 mon	Mon 12/27/21	Fri 1/21/22
44	Inverter to transformer wiring	2 wks	Mon 1/24/22	Fri 2/4/22
45	**MV Substation and Network Construction**	**195 days**	**Mon 8/9/21**	**Fri 5/6/22**
46	MV substation pad permitting and MV route permittir	1 wk	Mon 8/9/21	Fri 8/13/21
47	MV substation pad placement	2 wks	Mon 8/16/21	Fri 8/27/21
48	PV Inverter to Transformer Installation	2 wks	Mon 8/30/21	Fri 9/10/21
49	ESS Inverter to Transformer Installation	3 mons	Mon 8/30/21	Fri 11/19/21
50	MV Trenching	3 mons	Mon 11/22/21	Fri 2/11/22
51	MV Wire placement	3 mons	Mon 2/14/22	Fri 5/6/22
52	**End User MG Installation**	**163 days**	**Mon 3/14/22**	**Wed 10/26/22**
53	Critical Load Panel Installations	3 mons	Mon 3/14/22	Fri 6/3/22
54	Site Controller Installation	3 mons	Mon 6/6/22	Fri 8/26/22
55	Communications Testing	1 mon	Mon 8/29/22	Fri 9/23/22
56	Commisioning	23 days	Mon 9/26/22	Wed 10/26/22



Project: Jackson Project Schedule
Date: Fri 6/4/21

Task
Split
Milestone
Summary
Project Summary
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
External Tasks
External Milestone
Deadline
Progress
Manual Progress

NRI000413

cleanenergy.org
Southern Alliance for Clean Energy

October 8, 2021

Tennessee Public Utility Commission
502 Deaderick Street
4th Floor
Nashville, TN 37243
Delivered electronically to TPUC Docket #21-00061

***Amicus* Brief From SACE On Benefits Of The Jackson Solar + Storage Facility TPUC Docket #21-00061**

Southern Alliance for Clean Energy ("SACE") is a non-profit organization that promotes responsible and equitable energy choices that ensure clean, safe and healthy communities throughout the Southeast. After more than 30 years, SACE remains the only regional organization solely focused on transforming the way we produce and consume energy in the Southeast. SACE has more than 850 members and 26,000 supporters that live in Tennessee who are concerned about reducing emissions that contribute to extreme weather from climate change; creating jobs and economic development in the clean energy sector; and reducing electric bills' burden through effective efficiency programs.

We respectfully submit this *amicus* brief to the docket and appreciate your consideration of our comments.

The Jackson solar + storage project will bring many benefits to the Jackson community. The combination of solar with storage adds a particularly resilient component to the well documented economic and environmental benefits of local solar and the cooperative structure of the project would extend the benefits of solar to businesses for which solar is currently difficult to access.

We respectfully ask the Tennessee Public Utility Commission to issue a declaratory ruling as Jackson Sustainability Cooperative seeks. It is important that the project proceed so that Tennesseans realize the many benefits the project would provide.

Businesses and residents of Jackson stand to benefit from the project through local jobs, tax revenue, economic development and workforce development, and a healthier environment.

The Jackson Project Would Create Local Benefits for the Jackson Community With Jobs, Tax Revenue, Economic Development, and Workforce Development

The local benefits of the Jackson solar + storage project are more than enough to justify its approval. These benefits include direct jobs and local taxes, and go far beyond that to also include local economic development, experience with a model that can be replicated across the state, and cleaner air and water as the solar replaces TVA power from fossil fueled power plants.

The internships and training programs that will be made available in the Jackson community in development and operation of the solar + storage facility have the potential to turn Jackson into a hub for clean energy workforce development. The national goal of decarbonizing the electric grid

by 2035,[1] and even to meet the Tennessee Valley Authority (TVA)'s goal of decarbonizing by 2050,[2] will require an increase in workers trained in clean energy fields related to solar, energy storage, and energy conservation and management. The most recent *National Solar Jobs Census*[3] established that reaching 100% clean electricity by 2035 will require more than 900,000 solar workers in the U.S. -- more than double the projection with current policies and almost four times the U.S. solar workforce from 2020. The experience gained in building this solar + storage facility is experience that is invaluable. As projects like this one are replicated across the state, country, and world, workers that were trained on the Jackson facility will become sought after for this unique experience.

Extreme weather events, such as heavy thunderstorms, rainfall, and flooding, continue to increase in frequency and severity and can lead to more frequent and longer power outages. The ability of the Jackson solar + storage facility to continue to provide power to its members during power outages is a major benefit of the proposed project. This could lead to fewer interruptions in business operations and thus improvements to the local economy and tax base. Advanced manufacturing and computing are businesses that the state would like to attract more of to the state, and they are businesses that could benefit from the resilience provided by the Jackson solar + storage facility.

The Project's Economic Benefits Are Important To Jackson In Particular

The economic development and workforce development opportunity presented by the Jackson solar + storage project could be particularly important for Jackson in specific, where many residents face financial hardships. According to the United Way of Tennessee one in three people living in Jackson's 38301 zip code– even before the COVID pandemic –lives in poverty and the wages of nearly half of Jackson residents are not living wages, barely covering basic necessities.[4]

The economic issues are amplified looking even closer at the particular part of Jackson where the project is proposed. According to the 2010 Jackson Revitalization Strategy/Community Redevelopment Plan,[5] the central east district of Jackson, "*has been recognized by Jackson leadership as an integral neighborhood representing the greatest concentration of disadvantage population, depressed housing values,* [and] *high unemployment*." The report also notes that median incomes of the area at below $18,500 per year were about half of the citywide median income and that "*instances of neglect, structural deficiency, and dilapidation in the East Jackson Planning District are significant, frequent, and widespread*."

It is recognized by the Jackson community that this area has been underinvested in and would benefit from economic opportunities such as the Jackson solar + storage project, which would invest in local neighborhood infrastructure, provide local jobs, contribute tax revenue, and bolster the local major employers who receive the power from the co-op.

The Environmental Benefits of Solar Deployment Are Necessary And In The Public Interest

Clean energy deployment--and specifically solar energy deployment--benefits communities environmentally as well as economically. Public awareness about the severity of the climate crisis

[1] The White House (April 21, 2021). "FACT SHEET: President Biden Sets 2030 Greenhouse Gas Pollution Reduction Target Aimed at Creating Good-Paying Union Jobs and Securing U.S. Leadership on Clean Energy Technologies."
[2] TVA (May 6, 2021). "TVA Charts Path to Clean Energy Future."
[3] The Solar Foundation (May 2021). *National Solar Jobs Census 2020*, page 17.
[4] Cassandra Stephenson, *Jackson Sun* (Nov. 15, 2019). "United Way report: Nearly half of Jackson households do not make a 'livable' wage."
[5] Looney Ricks Kiss (August 2010). *Jackson Center City Revitalization Project - District 2*, Pp. 19, 25.

and the need to take immediate action to reduce greenhouse gas emissions is growing. The Intergovernmental Panel on Climate Change (IPCC)'s recent Assessment Report has been widely characterized as a "code red" for climate, noting that extreme weather events are fueled by greenhouse gas emissions and the impacts of global warming will get worse unless there are immediate and large reductions in carbon pollution. For Jackson residents specifically, the impacts of a warming climate could be particularly strong since in the words of the most recent National Climate Assessment, "*lower-income and other marginalized communities have lower capacity to prepare for and cope with extreme weather and climate-related events and are expected to experience greater impacts.*"[6] The immediate and large reductions in greenhouse gas emissions needed to avoid the worst impacts of climate warming necessitate a large buildout of solar and other clean energy resources, such as what the Jackson solar + storage project exemplifies. In addition to its climate benefits, solar energy improves local environmental conditions as it offsets the need to burn fossil fuels and in turn results in cleaner air and water, and thus improves public health.

The Project Represents a New Model For Tennessee Businesses to Access the Benefits of Solar Despite TVA's Limited Solar Options

While there are varying visions for how energy will be produced and consumed in the years and decades to come, one generally agreed-upon constant is that it must be free from carbon emissions. Entities across the country and around the world are evaluating how their energy is produced and consumed, and what measures can be taken to reduce pollution and costs. Solar energy, with its economic and environmental benefits, is an ideal energy source for supplying large portions of our power, and consequently many businesses have made decisions to build or procure solar energy, whether for environmental or economic benefits.

Yet while TVA has set up a program for their largest and most influential customers to take advantage of solar's lower costs and cleaner energy, TVA has also taken strides to limit the ability of smaller customers to invest in solar on their property and be compensated for the services that solar provides to neighbors and fellow customers. To date TVA's program for large customers, the Green Invest program, has worked to meet the needs of large corporations like Facebook and Google, and large utilities serving cities with clean energy goals that are not met with TVA's fossil-fueled power, like Knoxville and Nashville. But TVA's Green Invest program does not fit the needs of the businesses that have evaluated it and other options, and decided their best investment is in a local solar + storage facility that provides benefits across the community.

To help more Tennesseans access the benefits of solar, we need more tools in the toolkit. The innovative model demonstrated by the Jackson solar + storage project is an example of just such an additional tool that would allow more residents to benefit from solar.

In our pressing need to address the climate crisis and bring about local economic benefits, public interest is served by encouraging, rather than discouraging, such innovative models and opportunities for expanded access to the benefits of solar.

In recommending the Public Utility Commission to deny the Applicant's request, and therefore prohibit the project from proceeding, it appears that TVA is taking a similar heavy-handed approach to the Jackson Sustainability Cooperative that it has employed in limiting access to solar in other instances.

[6] U.S. Global Change Research Program (2018). Fourth National Climate Assessment, Volume II: Impacts, Risks, and Adaptation in the United States. Summary Findings.

Conclusion

The Jackson solar + storage facility will provide environmental, economic, and electricity benefits to its members, the Jackson community, and the state as a whole. As such it is important that the project move forward. It is misleading to characterize this project as out of step with the goals of the state and its primary electricity provider, the Tennessee Valley Authority. While the Applicant is seeking to move this project full of public benefits forward in good faith, TVA appears to be seeking to stop or delay the project, thus denying the many potential benefits the project could bring to the Jackson community. We respectfully ask the Commission to issue a declaratory ruling as Jackson Sustainability Cooperative seeks.

Respectfully submitted,

Stephen A. Smith
Executive Director
Southern Alliance for Clean Energy

CAB1000/AC

Up to 1500 VDC
Utility-grade energy storage inverter
Scalable to 4 MW

Return on Investment
- 98% max efficiency
- Low shipping & installation cost
- Modular 1 MW blocks
- Monetizable dynamic performance

Modular / flexible configuration
- 1 MW blocks, up to 1500 VDC
- Configurable up to 4 MW
- Individual AC connections or combined throat
- Able to mix inverters & DC-DC in a single lineup

Simple O&M
- Easily maintainable
- Modular design with low component count
- Extended warranty available

Easily Transportable
- Standard freight = low transportation cost
- Moveable with pallet jack or standard forklift
- No crane required
- Separable building blocks

Advanced Technology
- Parallel UPS functionality
- Fully parameterizable grid support
- Certified to standards: UL1741 / IEC
- ZVRT / LVRT / 4-quadrant high bandwidth control

The CAB1000 scalable platform was specifically developed to offer a straightforward and simple solution to developers of Utility-grade energy storage systems. In ~1 MW blocks, the CAB1000 platform offers a single modular system which is tailored to Utility systems of all sizes. The scalable power conversion system also boasts high-performance controls and system redundancy.

With world-class power density and an easy to install design, your energy storage system will be commissioned quickly and easily. The energy storage PCS has never been more flexible or straightforward.

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NRI000464

MODEL		CAB1000/AC-690		
LINEUP QTY		**1**	**...**	**4**
AC	AC port configuration	3-wire (3P3W)		
	AC voltage range	690 VRMS +10% / -12%		
	AC export capacity *(1)* @ 25°C	1370 kVA | 1146 ARMS		5480 kVA | 4584 ARMS
	AC export capacity @ 45°C	1272 kVA | 1064 ARMS		5088 kVA | 4256 ARMS
	AC import capacity @ 25°C	1143 kVA | 956 ARMS		4572 kVA | 3824 ARMS
	AC import capacity @ 45°C	1017 kVA | 851 ARMS		4068 kVA | 3404 ARMS
	Inverter type	3-Level VSC		
	Minimum grid SCCR *(2)*	2		
	Nominal frequency range	50 - 60 Hz (field settable)		
	Harmonic distortion	UL1741 / IEEE 1547, <2% TDDi per IEEE 519		
	Power factor / reactive power	0 leading ... 0 lagging (full 4-quadrant operation)		
	Maximum aux. power consumption	950 W	...	3800 W
	Efficiency: Max | CEC | Euro	98.6% (est.) | >98% (est.) | >98% (est.)		
DC	DC voltage range *(3)*	976 - 1500 VDC		
	Typical Lithium battery voltage range	1065 - 1500 VDC		
	Maximum DC current	1404 ADC		5616 ADC
	Battery technology	all battery types, fuel cells, other DC sources, etc.		
	Number of DC inputs	1	...	4
Environmental	Ambient temperature (operation)	-20°C to 50°C		
	Ambient temperature (storage)	-20°C to 60°C		
	Protection degree	NEMA 3R / IP54		
	Relative humidity	5% - 100% condensing		
	Max elevation	2,000 m [6,500 ft.]		
	Airborne noise	<75 dBA @ 5m		
	Temperature de-rating	automatic; see charts		
Cabinet	Maximum dimensions (H x W x D)	mm: [2275 x 1004 x 1200] in.: [89.6 x 39.5 x 47.2]	...	mm: [2275 x 4931 x 1200] in.: [89.6 x 194 x 47.2]
	Weight (est.)	1043 kg [2300 lb.]		(4) x 1043 kg [(4) x 2300 lb.]
	Mounting	Pad mount		
	Cooling	Hybrid liquid / air		
	Cooling fluid	30% - 50% EWG or PWG		
Certifications (pending)	Safety	UL 1741 | C22.2 No. 107.1-16		
	Utility interconnect	UL 1741:2010 R2.18 (SA) | IEEE 1547.1-2005 | CA Rule 21 No. 16-06-052 | Hawaii Rule 14 No. 2014-0192		
Protections	AC protection	fuses		
	DC protection	fuses (optional)		
	Humidity	internal cabinet heating		
	Safety features	overvoltage, overcurrent, overtemperature		
	Ground fault detection	integrated		
Control	Control interface	CAN, Modbus RS485, or Modbus TCP		
	Command latency	1 ms		
	Response time; (time to new setpoint)	8 ms; adjustable longer via parameters		
	On-off grid transitions	Yes | UPS mode available		
	Black-start capable	Yes; requires external control power		
	Grid-tied control modes	Voltage mode | PQ (power) | DQ (current) | cos phi (pf)		
	Grid-support functions	Volt/VAR | Hz/Watt | Volt/Watt | inertia		
	Islanded control modes	V&f | droop control | inertia | Ok to parallel with other sources		
	Island overload avoidance	active inrush limiting for starting large loads		
	Control power options	208 - 240 VAC | DC: 24 VDC		

(1) Power ratings at nominal line voltage.

(2) Minimum SCCR operation requires inverter to be in 'spinning reserve' mode. Contact EPC Power for details.

(3) Minimum DC voltage at nominal AC line voltage.

MODEL		CAB1000/AC-630		
LINEUP QTY		**1**	**...**	**4**
AC	AC port configuration	3-wire (3P3W)		
	AC voltage range	630 VRMS +10% / -12%		
	AC export capacity *(1)* @ 25°C	1250 kVA | 1146 ARMS		5000 kVA | 4584 ARMS
	AC export capacity @ 50°C	1125 kVA | 1031 ARMS		4500 kVA | 4124 ARMS
	AC import capacity @ 25°C	1056 kVA | 968 ARMS		4224 kVA | 3872 ARMS
	AC import capacity @ 50°C	938 kVA | 860 ARMS		3752 kVA | 3440 ARMS
	Inverter type	3-Level VSC		
	Minimum grid SCCR *(2)*	2		
	Nominal frequency range	50 - 60 Hz (field settable)		
	Harmonic distortion	UL1741 / IEEE 1547, <2% TDDi per IEEE 519		
	Power factor / reactive power	0 leading ... 0 lagging (full 4-quadrant operation)		
	Maximum aux. power consumption	950 W	...	3800 W
	Efficiency: Max | CEC | Euro	98.6% (est.) | >98% (est.) | >98% (est.)		
DC	DC voltage range *(3)*	892 - 1500 VDC		
	Typical Lithium battery voltage range	925 - 1350 VDC		
	Maximum DC current	1403 ADC		5612 ADC
	Battery technology	all battery types, fuel cells, other DC sources, etc.		
	Number of DC inputs	1	...	4
Environmental	Ambient temperature (operation)	-20°C to 50°C		
	Ambient temperature (storage)	-20°C to 60°C		
	Protection degree	NEMA 3R / IP54		
	Relative humidity	5% - 100% condensing		
	Max elevation	2,000 m [6,500 ft.]		
	Airborne noise	<75 dBA @ 5m		
	Temperature de-rating	automatic; see charts		
Cabinet	Maximum dimensions (H x W x D)	mm: [2275 x 1004 x 1200] in.: [89.6 x 39.5 x 47.2]	...	mm: [2275 x 4931 x 1200] in.: [89.6 x 194 x 47.2]
	Weight (est.)	1043 kg [2300 lb.]		(4) x 1043 kg [(4) x 2300 lb.]
	Mounting	Pad mount		
	Cooling	Hybrid liquid / air		
	Cooling fluid	30% - 50% EWG or PWG		
Certifications (pending)	Safety	UL 1741 | C22.2 No. 107.1-16		
	Utility interconnect	UL 1741:2010 R2.18 (SA) | IEEE 1547.1-2005 | CA Rule 21 No. 16-06-052 | Hawaii Rule 14 No. 2014-0192		
Protections	AC protection	fuses		
	DC protection	fuses (optional)		
	Humidity	internal cabinet heating		
	Safety features	overvoltage, overcurrent, overtemperature		
	Ground fault detection	integrated		
Control	Control interface	CAN, Modbus RS485, or Modbus TCP		
	Command latency	1 ms		
	Response time; (time to new setpoint)	8 ms; adjustable longer via parameters		
	On-off grid transitions	Yes | UPS mode available		
	Black-start capable	Yes; requires external control power		
	Grid-tied control modes	Voltage mode | PQ (power) | DQ (current) | cos phi (pf)		
	Grid-support functions	Volt/VAR | Hz/Watt | Volt/Watt | inertia		
	Islanded control modes	V&f | droop control | inertia | Ok to parallel with other sources		
	Island overload avoidance	active inrush limiting for starting large loads		
	Control power options	208 - 240 VAC | DC: 24 VDC		

(1) Power ratings at nominal line voltage.

(2) Minimum SCCR operation requires inverter to be in 'spinning reserve' mode. Contact EPC Power for details.

(3) Minimum DC voltage at nominal AC line voltage.

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MODEL		CAB1000/AC-480		
Lineup Quantity		**1**	**...**	**4**
AC	AC port configuration	3-wire (3P3W)		
	AC voltage range	480 VRMS +10% / -12%		
	AC export capacity *(1)* @ 50°C	1081 kVA | 1300 ARMS		4324 kVA | 5200 ARMS
	AC import capacity @ 50°C	1021 kVA | 1228 ARMS		4084 kVA | 4912 ARMS
	Inverter type	2L - VSC		
	Minimum grid SCCR *(2)*	2		
	Nominal frequency range	50 - 60 Hz (field settable)		
	Harmonic distortion	UL1741 / IEEE 1547, <2% TDDi per IEEE 519		
	Power factor / reactive power	0 leading ... 0 lagging (full 4-quadrant operation)		
	Maximum aux. power consumption	950 W	...	3800 W
	Efficiency: Max | CEC | Euro	98.6% (est.) | >98% (est.) | >98% (est.)		
DC	DC voltage range *(3)*	679 - 1250 VDC		
	Typical Lithium battery voltage range	710 - 1000 VDC		
	Maximum DC current	1461 ADC		5844 ADC
	Battery technology	all battery types, fuel cells, other DC sources, etc.		
	Number of DC inputs	1	...	4
Environmental	Ambient temperature (operation)	-20°C to 50°C		
	Ambient temperature (storage)	-20°C to 60°C		
	Protection degree	NEMA 3R / IP54		
	Relative humidity	5% - 100% condensing		
	Max elevation	2,000 m [6,500 ft.]		
	Airborne noise	<75 dBA @ 5m		
	Temperature de-rating	automatic; see charts		
Cabinet	Maximum dimensions (H x W x D)	mm: [2275 x 1004 x 1200] in.: [89.6 x 39.5 x 47.2]	...	mm: [2275 x 4931 x 1200] in.: [89.6 x 194 x 47.2]
	Weight (est.)	1043 kg [2300 lb.]		(4) x 1043 kg [(4) x 2300 lb.]
	Mounting	Pad mount		
	Cooling	Hybrid liquid / air		
	Cooling fluid	30% - 50% EWG or PWG		
Certifications (pending)	Safety	UL 1741 | C22.2 No. 107.1-16		
	Utility interconnect	UL 1741:2010 R2.18 (SA) | IEEE 1547.1-2005 | CA Rule 21 No. 16-06-052 | Hawaii Rule 14 No. 2014-0192		
Protections	AC protection	fuses		
	DC protection	fuses (optional)		
	Humidity	internal cabinet heating		
	Safety features	overvoltage, overcurrent, overtemperature		
	Ground fault detection	integrated		
Control	Control interface	CAN, Modbus RS485, or Modbus TCP		
	Command latency	1 ms		
	Response time; (time to new setpoint)	8 ms; adjustable longer via parameters		
	On-off grid transitions	Yes | UPS mode available		
	Black-start capable	Yes; requires external control power		
	Grid-tied control modes	Voltage mode | PQ (power) | DQ (current) | cos phi (pf)		
	Grid-support functions	Volt/VAR | Hz/Watt | Volt/Watt | inertia		
	Islanded control modes	V&f | droop control | inertia | Ok to parallel with other sources		
	Island overload avoidance	active inrush limiting for starting large loads		
	Control power options	208 - 240 VAC | DC: 24 VDC		

(1) Power ratings at nominal line voltage.

(2) Minimum SCCR operation requires inverter to be in 'spinning reserve' mode. Contact EPC Power for details.

(3) Minimum DC voltage at nominal AC line voltage.

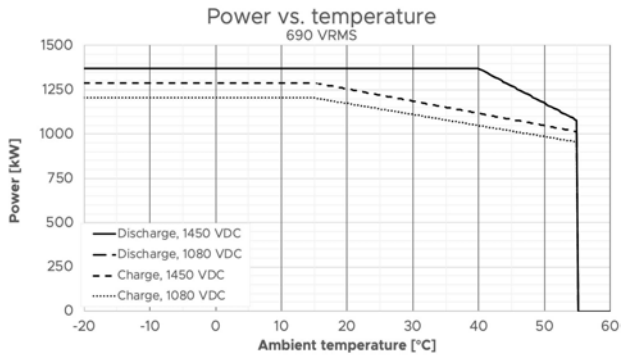
Full-function, independent blocks.

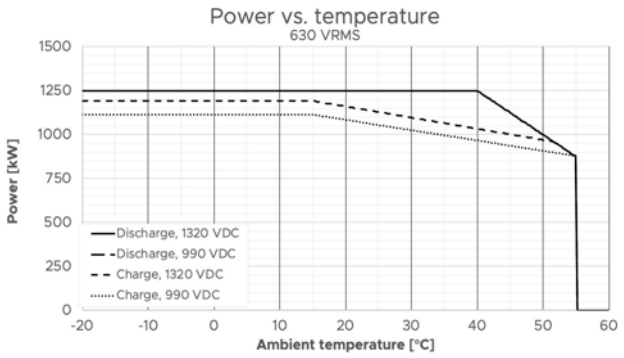
Each 1MW block is designed to support connections to independent battery banks.

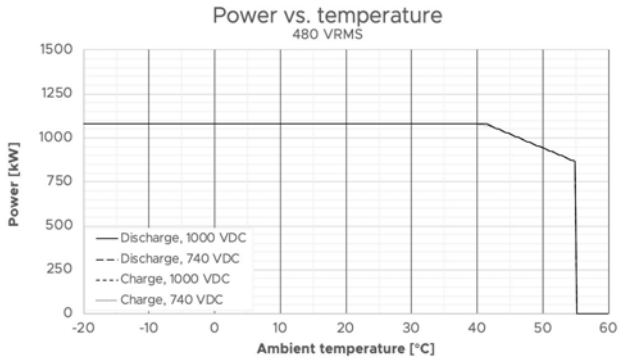
Each CAB1000 contains fully independent AC & DC disconnects, fuses, utility-grade surge suppression, environmental controls, precharge, enabling an easy installation.

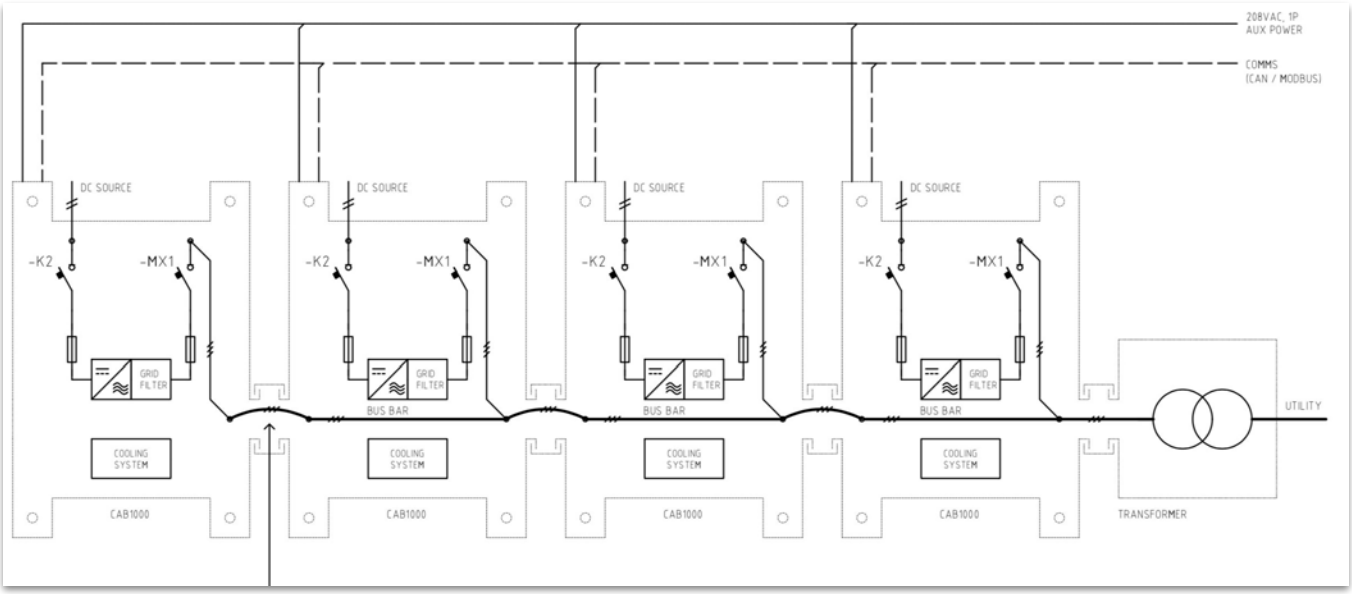
Keep the transformer simple, please

A multi-winding transformer is NOT required. The MV transformer can be obtained from EPC Power or directly from suppliers such as ABB who have pre-engineered matching units to suit your power rating and application needs.









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Fwd: Announcement of contract award

Miki Domine <miki@instanton.energy>
Mon 9/14/2020 4:34 PM
To: Ben Spittle <bspittle@northernreliability.com>

I am getting the info you asked for now. But here is the award email.

Miki Domine
Operations
Instant On, LLC

m. 714 380 4240
e. miki@instanton.energy
w. www.instanton.energy

---------- Forwarded message ---------
From: **Dennis Emberling** <de@comdevent.com>
Date: Mon, Sep 14, 2020 at 1:02 PM
Subject: Announcement of contract award
To: AJ Perkins <aj@instanton.energy>
Cc: David Shimon <ds@easolar.net>

Dear AJ,

I'm happy to let you know Community Development Enterprises has selected Instant On to design, develop, engineer, and construct our Solar Microgrid project in Jackson, Tennessee, in collaboration with SunPower Corp. for the solar side of the project.

Please send us your contract, payment terms, schedule, and other materials to sign.

We're very much looking forward to working with you and your team on this first-of-a-kind solar microgrid for the U.S.A.

Best,

Dennis Emberling, CEO

MARK 1
ENERGY STORAGE SOLUTION

NRI000470

Mark 1 Energy Storage Rack

Designed from the ground up to be an optimized energy storage platform capable of delivering industry leading performance in the 1500Vdc class

Unsurpassed Safety

KORE's lithium-ion batteries have been extensively tested to meet rigorous safety standards. Our proprietary design has never had a manufacturing related incident.

Energy	110.7 kWh
Capacity	110 Ah
Nominal Voltage	1006.4 V
Voltage Range	762 V - 1170 V
Dimensions (W x D x H)	520 x 655 x 2260 mm
Weight	1200 kg

Energy and Capacity are representative values at .3 C - capacity differs with varying C rates
Rack design subject to change due to design optimization for maximum of 124 kWh storage and/or customer requirements

Contact Information:
sales@korepower.com
korepower.com/mark1

KOREPOWER

KREBS & LANSING

Consulting Engineers Inc.
164 Main Street, Suite 201
Colchester, Vermont 0544€
(802) 878-0375

INVOICE

Ben Spittle
Northern Reliability (bspittle@northernreliab
81 Demeritt Place
Waterbury, VT 0567€

Dated: December 4, 2020
Invoice#: 26493
Job#: 20304.

Northern Reliability
, East Jackson

East Jackson, Tennessee Site Modeling to See Maximum Site Production	$165.00
Subtotal:	$165.00
Credit for Payments Received:	$0.00
Amount Due:	**$165.00**

PLEASE INCLUDE OUR INVOICE# AND JOB# ON YOUR CHECK STUB

Terms: Net - 30 days; Interest of 1-1/2% per month after 30 days.

11 EER **3.3 COP**

Air Conditioners & Heat Pumps

Meet our next generation of Wall-Mount™ Solutions

Smart Engineering. Trusted Protection. Rugged Reliability.

Same fit.
New technology.

Bard®
SINCE 1914

NRI000567

Same fit.
New technology.

- All models have the same supply and return openings as units from the past 50+ years – no need to cut new holes
- Great service access to the compressor and filter drier locations
- Easy access for cleaning the condenser coil
- Side and back electrical knockouts for easy installation
- Electric heat access with wire chase

Color Options

W42AC-W72AC SERIES & W42HC-W60HC SERIES

3.5-6 TON // Wall-Mount Air Conditioners
3.5-5 TON // Wall-Mount Heat Pumps

- Industrial grade center control panel and wiring
- No vent hood

11 EER **3.3 COP**

3.5-4 TON

- 42.075-inches (W)
  25.320-inches (D)
  84.875-inches (H)
  (3" deeper than 10 EER)

W18AB-W36AB SERIES & W18HB-W36HB SERIES

1.5-3 TON // Wall-Mount Air Conditioners and Heat Pumps

- Right and left hand access

11 EER **3.3 COP**

5 TON

- 42.075-inches (W)
  25.320-inches (D)
  93.000-inches (H)
  (3" deeper than 10 EER)

10 EER

6 TON

6 ton system is 10 EER per DOE mandate.

- 6 ton cooling capacity
- Center Control Panel
- No vent hood
- Dehumidification optional
- 42.075-inches (W),
  25.320-inches (D),
  93.000-inches (H)
  (now 3" deeper)

11 EER **3.3 COP**

1.5-2 TON

- 33.300-inches (W),
  17.125-inches (D),
  74.563-inches (H)

11 EER

W12AB SERIES

1 TON // Wall-Mount Air Conditioner

- 32.000-inches (W),
  14.630-inches (D),
  48.000-inches (H)

11 EER **3.3 COP**

2.5-3 TON

- 38.200-inches (W),
  17.125-inches (D),
  74.563-inches (H)

NRI000568

Smart Engineering.

Bard is leading the industry from 11 EER and beyond. Quieter operation, healthier air quality, higher operating efficiencies and environmentally friendly solutions – we deliver ingenious simplified design with the most innovative technology inside. Meet our newest advanced technologies.

STANDARD *on new 11 EER Wall-Mounts*

BALANCED CLIMATE™

Benefits:

- **Use of Patent Pending Balanced Climate™ feature removes up to 35% more humidity than any other standard or basic wall-mount unit on the market**
- All units are shipped with a Y1/Y2 jumper
- Leave the jumper in place with a single stage thermostat and the system will function as a standard air conditioner
- Remove the jumper and utilize a 2-stage thermostat to activate Balanced Climate configuration, which allows for enhanced humidity removal and quieter startups
- Reduce humidity and significantly improve efficiency by allowing the occupant to raise the cooling temperature on the thermostat
- Low ambient kit recommended if used with ventilation systems
- Quieter and warmer start-up in heat pump

STANDARD *on Wall-Mounts*

HYDROPHILIC EVAPORATOR COILS

Benefits:

- Increases wettability, therefore increasing cascading effect
- Increases speed of drainage which helps prevent growth of mold and bacteria
- Can increase resistance to certain corrosives
- This feature was previously standard only on higher-end units, and is now standard on all units

Does not replace the need for fully coated coils in corrosive environments

STANDARD *on new 11 EER Wall-Mounts*

NATURAL FIBER INSULATION

Benefits:

- Fiberglass replaced by cotton insulation
- No fiberglass in airstream
- Earth-friendly manufacturing
- Cleaner and healthier environment for your team and ours

NRI000569

Bard® Trusted Protection.

To learn more about our industry-leading features, send us an email at **sales@bardhvac.com**

BRUSHLESS DC BLOWER MOTOR/ECM

Benefits:

- Electronically Commutated Blower Motor allows extremely efficient motor run with continuous fan
- Continuous blower option constantly filters the air for better air quality and balances room temperature
- Quieter blower operation

STANDARD *on Wall-Mounts*

DEHUMIDIFICATION UNIT ENHANCEMENTS

Benefits:

- All new 11 EER WA and WH Series Dehumidification units equipped with Electronic Expansion Valve (EEV) for metering and low pressure transducer for pressure monitoring
- Significantly improves and balances superheat calibration by constantly adjusting the refrigerant flow
- Reduces warm/cold temp swings
- Soft-shift technology is quieter, making transition to dehumidification mode more comfortable

OPTIONAL *on new 11 EER Wall-Mounts*

LOW LEAKAGE DESIGN

Benefits of CRV:

- Commercial Room Ventilation (CRV) available in Fixed and Modulating (the 1.5-3 ton Modulating CRV's even meet the stringent 4CFM low leakage certification level)
- Meets or exceeds all code requirements in a cost effective manner

Benefits of ERV:

- Energy Recovery Ventilator (ERV) equipped with built-in room pressurization design
- Provides ventilation with minimal loss of conditioned air.
- Exchanges up to 82% of temperature and humidity
- Return on investment in long term cost savings

Benefits of Fresh Air Damper:

- Equipped with barometric exhaust relief
- Standard on new 11 EER Wall-Mounts

OPTIONAL *on new 11 EER Wall-Mounts*

NRI000570

Bard® Rugged Reliability.

Find out how telecom, school systems, e-buildings, modular structures and others use Bard to their advantage by visiting our website at **bardhvac.com**

ENCLOSED CONDENSER FAN MOTOR

Benefits:

- Totally enclosed Condenser Fan Motor means longer life, more durability, higher heat rating, and better operation in low ambient conditions
- Wall-Mount units can now handle more extreme environments and temperatures
- Added ball bearings = improved efficiency and longer life

STANDARD on new 11 EER Wall-Mounts

LOCKABLE ACCESS PANEL

Benefits:

- Added safety and security
- Protects access to breaker
- (lock not included)

STANDARD on new 11 EER Wall-Mounts

DIRTY FILTER INDICATOR

Benefits:

- New pressure sensor triggers indicator to show when filter change is due
- Saves time and money – prevents missing a necessary change or changing more frequently than needed

OPTIONAL *on new 11 EER Wall-Mounts*

100% FULL FLOW ECONOMIZER

Benefits:

- All sizes field installable
- 1.5 - 3 ton models meet 4CFM low-leakage certification requirements (large cabinet economizer not yet rated)
- 3.5 - 6 ton models feature no hood
- Economizer control located in the center control panel of 3.5-6 ton models
- Potential cost savings with lower utility usage

OPTIONAL *on new 11 EER Wall-Mounts*

NRI000571

Breathe easy. *You've got Bard.*

11 EER **3.3 COP**

We stand ready to meet the 11 EER / 3.3 COP mandates and exceed your expectations. With 100+ years of heritage and history backing us, we remain committed to driving the future of the HVAC industry.

All new models have the same supply and return openings as units from the past 50+ years, so no need to cut new holes.

Smart Engineering. Trusted Protection. Rugged Reliability.

SCHOOLS

EQUIPMENT SHELTERS & TELECOM

MODULAR

LIGHT COMMERCIAL & MOBILE

INTERNATIONAL

RESIDENTIAL

Bard® SINCE 1914

Bard Manufacturing Company, Inc.
1914 Randolph Dr., Bryan, OH 43506
419-636-1194

www.bardhvac.com
sales@bardhvac.com

NRI000572

Supplemental Instructions

Models:

W24HBD W30HBD W36HBD W42HCD W48HCD W60HCD

This model provides a unique dehumidification circuit for periods of low outdoor ambient temperature and high indoor humidity conditions.

Refer to Specification Sheets S3584 and S3592 for the standard features of the base units and this manual for electrical data.

Dehumidification Circuit

The dehumidification circuit incorporates an independent heat exchanger coil in the supply air stream. This coil reheats the supply air after it passes over the cooling coil without requiring the electric resistance heater to be used for reheat purposes. This results in very high mechanical dehumidification capability from the air conditioner on demand without using electric resistance reheat.

The dehumidification refrigerant reheat circuit is controlled by a dehumidification valve directing the refrigerant gas to the normal condenser during periods when standard air conditioning is required. During periods of time of low ambient temperature (approximately 65° to 75° outdoor) and high indoor humidity, a humidistat senses the need for mechanical dehumidification. It then energizes both the compressor circuit and the dehumidification valve, thus directing the hot refrigerant discharge gas into a separate desuperheating condenser circuit, which reheats the conditioned air before it is delivered to the room. The refrigerant gas is then routed from the desuperheating condenser to the system condenser for further heat transfer. When the humidistat is satisfied, the system automatically switches back to normal A/C mode and either continues to operate or turns off based on the signal from the wall thermostat. The result is separate humidity control at minimum operating cost.

Dehumidification Sequence of Operation

Dehumidification is controlled through the thermostat (if capable) or through a separate humidistat. On a call for dehumidification mode of operation, the compressor and dehumidification valve of the unit are energized through circuit R - D to provide dehumidification. Dehumidification will continue until the humidistat is satisfied.

Any time there is a call for circuit R - Y1, the dehumidification mode will cancel and the system will return to cooling or heat pump operation.

Balanced Climate™ Mode

It is recommended to enable Balanced Climate mode and utilize a 2-stage thermostat to enhance the dehumidification performance and comfort. To activate this mode, the jumper between Y1 and Y2 on the low voltage terminal strip needs to be removed and the unconnected purple wire laying in the cable duct needs to be pulled out and placed on the terminal block so that it connects to the yellow wire from the outdoor temperature switch. Refer to the unit wiring diagram for clarity.

NOTE: *In units with dehumidification, never have both the Balanced Climate jumper in place and the outdoor temperature switch connected at the same time!*

Bard Manufacturing Company, Inc.
Bryan, Ohio 43506

www.bardhvac.com

Manual: 7960-828E
Supersedes: 7960-828D
Date: 8-3-20

This mode will allow the indoor blower to run at a reduced airflow on the first stage of cooling. A 2-stage thermostat connected to Y2 will then allow the airflow to return to normal rated speed if the call for dehumidification or cooling is not satisfied within the allotted time frame specified by the thermostat. See latest revision of unit installation instructions 2100-703 or 2100-711 for more information regarding the Balanced Climate operation.

Electronic Expansion Valve

Operation

This model employs an electronic expansion valve (EEV) which meters the refrigerant to the evaporator. In the heat pump application, the EEV is used bi-directionally to meter the refrigerant in both heating and cooling modes. The EEV is made of a stepper motor that is controlled with a step output from the controller. The valve is capable of 480 steps which drives a needle valve that in turn regulates the flow of refrigerant. The EEV allows for tighter control and better capacity management in varying operating conditions than a standard TXV. The EEV system consists of the electronic valve and stator, control board, relay, suction temperature sensor and suction pressure transducer. The pressure transducer and temperature sensor monitor the suction line to provide real time data to the control board so that a real time superheat can be calculated. This then determines the EEV position. The controller is sent to maintain around 13° superheat. The relay is used to activate the EEV system's controller anytime that the compressor is energized.

WARNING/AVERTISSEMENT

- Exposure to high pressure refrigerant hazard.
- This unit is equipped with an electronic expansion valve. In order to fully recover refrigerant or evacuate the system during repairs, be sure to use service tool 2151-021 to manually open the electronic expansion valve or be sure to recover and evacuate from all service ports; suction, liquid, and discharge.
- Failure to do so could result in eye injuries and/or refrigerant burns.

- Exposition à un risque de réfrigérant à haute pression.
- Cet appareil est équipé d'un détendeur électronique. Afini de récupérer complètement le réfrigérant ou d'évacuer le système pendant les réparations, assurez-vous d'utiliser l'outil de service 2151-021 pour ouvrir manuellement le détendeur électronique ou assurrez-vous de récupérer et d'évacuer de tous les ports de service: aspiration, liquide et refoulement.
- Ne pas le faire pourrait entraîner des blessures auz yeux et / ou des brûlures de réfrigérant.

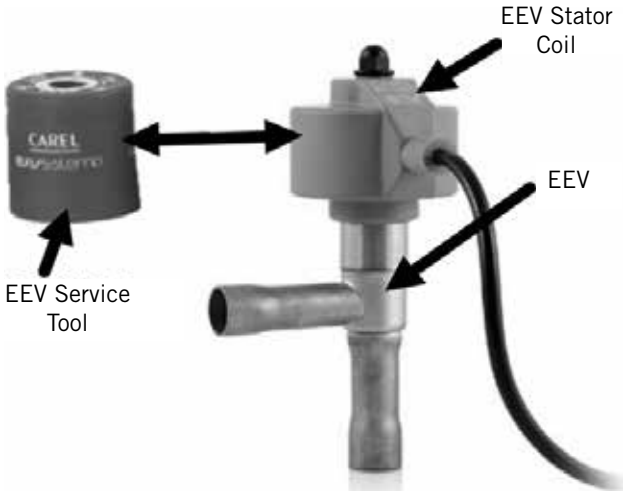
7961-953

EEV Instructions for Vacuuming, Reclaiming and Charging Unit

The electronic expansion valve moves to a closed position when there is no call to control. In order to pull a complete vacuum, fully reclaim the system or charge the unit, connections to all service ports—suction, liquid and discharge—need to be utilized or the valve needs to be manually opened first. The valve can be opened manually using the magnetic EEV service tool (Bard Part # 2151-021) shown in Figure 1. To do this, remove the EEV stator coil (red color with retaining nut on top), slide the magnetic tool over the shaft where the stator was removed and turn in a clockwise direction to open the valve to the full open position (directional arrows are provided on the tool).

Reapply the EEV stator coil and retaining nut once complete. Upon powering the unit back up, the control board will automatically drive the EEV back to the fully shut position. Once the compressor starts, the control board will again modulate the EEV position to control the system superheat.

FIGURE 1
Electronic Expansion Valve (EEV) and Service Tool



Troubleshooting the Electronic Expansion Valve

The control board has two status LEDs.

- The green LED should be lit anytime that the board has power and the control is functioning.
- The red LED is to show that an alarm is present.

See Table 1 for a guide to know where to start troubleshooting the EEV. Refer to the appropriate unit replacement parts manual for any parts that are needed.

Control Board

Check that the controller is getting 24VAC signal (GO 24VAC Hot and G 24VAC common). Reference unit wiring diagram for proper connections. If 24V is present but the green LED is not lit, replace the controller. If the green LED is now lit but the superheat is still not being maintained, troubleshoot the relay to check that the DI is connected to G; refer to **Relay in EEV Control Box** on page 3.

Electronic Expansion Valve

Check to see if valve can be moved by manually moving the stepper motor using the EEV service tool shown in Figure 1 (Bard Part # 2151-021). If valve still does not

TABLE 1
Electronic Expansion Valve Troubleshooting

Problem	Probable Cause	Troubleshoot
The green LED is not lit.	Controller not receiving 24VAC signal.	Control Board
The green LED is lit, but superheat is not being maintained.	The relay is not closing the controller's DI connection to ground.	Relay
The red LED is flashing and EEV is not controlling superheat properly (13° superheat). One of the following is likely the fault:		
1. Low superheat is detected and the controller is taking steps to protect the system by closing the valve.	Stator is broken or connected incorrectly.	Stator
	Valve is stuck open.	EEV Valve
2. Suction temperature sensor error.	Poor connection of sensor or faulty sensor.	Thermistor
3. Suction pressure transducer error.	Pressure transducer wiring incorrect or faulty transducer.	Transducer
The red LED is on steady.	The operating parameters have been damaged.	Replace Control Board

control, check the transducer and thermistor sensors as described on page 4. If sensors are good, replace the valve.

Relay in EEV Control Box

Contacts NO to DI and COM to G must be closed for EEV control to start controlling superheat. Check that the relay is getting 24VAC. Reference unit wiring diagram for proper connections. If 24V is present, measure the resistance between COM and NO; it should be 0 ohms when the relay is getting 24V. If the resistance is out of range, replace the relay.

Stator Coil

Disconnect the stator from the valve and the control and measure the resistance of the windings using an electrical tester. The resistance of both windings should be around 40 ohms +/– 10%. The four wire sets that will have resistance between them are: White and red, green and red, yellow and purple, blue and purple. If the resistance falls outside these values, replace the stator.

Transducer Sensor

1. Check continuity of all three wires from transducer plug to controller plug. Replace wires if poor connection in any wire.
2. Check to ensure wires are correctly connected as follows:

   Blue wire = pin 1 of controller plug to pin C on transducer plug

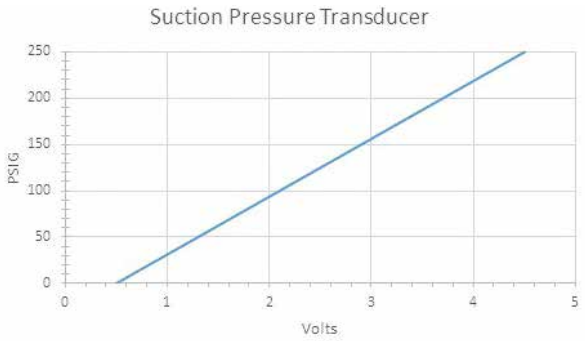
   Red wire = pin 2 of controller plug to pin B on transducer plug

   Black wire = pin 3 of controller plug to pin A on transducer plug
3. Check that there is 5VDC Nominal between the red and black wires going to the transducer.
4. Check the signal voltage between the blue and black wires (0.5-4.5VDC Actual). The following formula and Figure 2 can be used to determine if the transducer's voltage to pressure ratio is within range. Replace transducer if out of range.

Formula for Tech:

(Measured Pressure x .016) + .05 =
Expected Transducer Signal Voltage (see Figure 2)

FIGURE 2
Voltage to Pressure: Suction Pressure Transducer



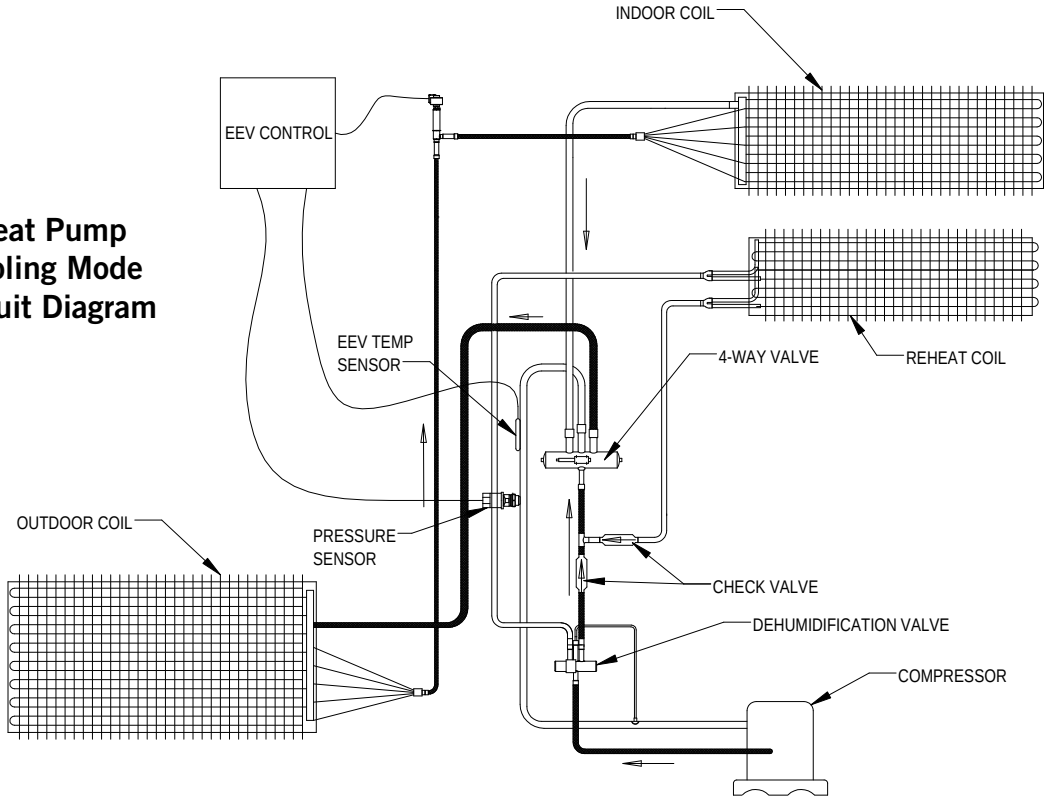
Thermistor Sensor

1. Make a visual check for broken wire insulation, broken wires or cracked epoxy material.
2. Disconnect 10k ohm NTC thermistor from the EEV control box.
3. Use an ohmmeter to measure the resistance between the two connectors. Also use ohmmeter to check for short or open.
4. Compare the resistance reading to Table 2. Use sensor ambient temperature. (Tolerance of part is ±10 %.)
5. If sensor is out of tolerance, shorted, open or reads very low ohms, it should be replaced.

TABLE 2
10K Ohm NTC Sensor: Temperature/Resistance

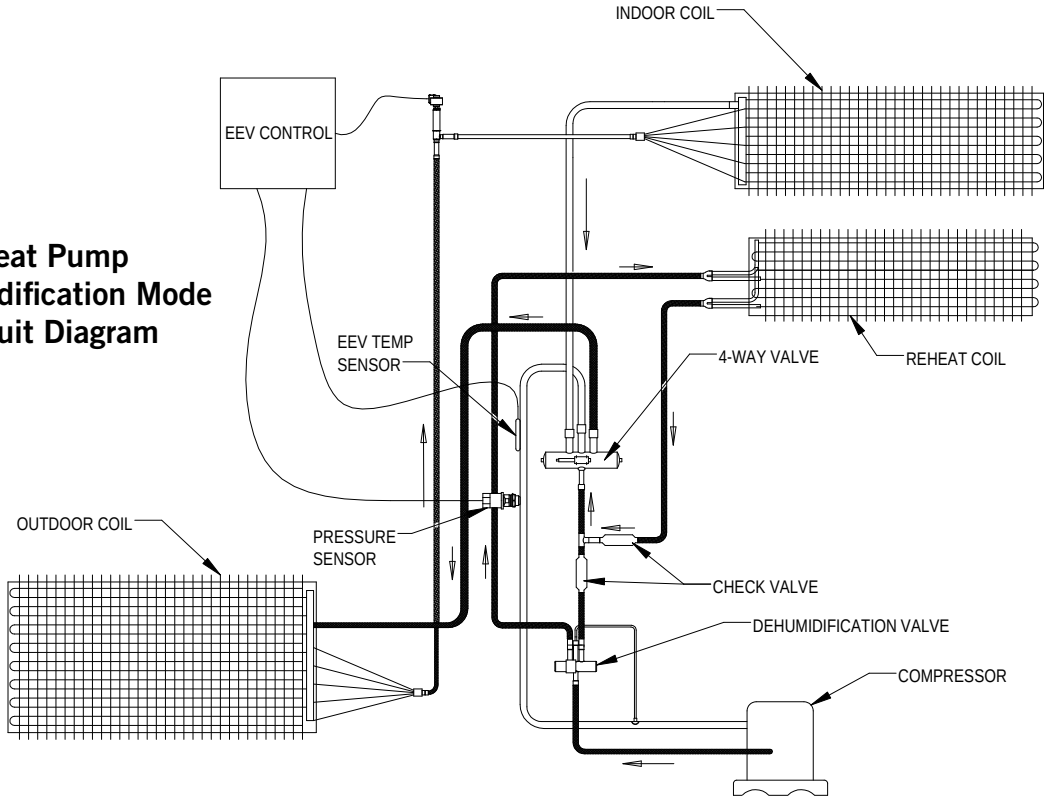
Temperature		Resistance	Temperature		Resistance	Temperature		Resistance	Temperature		Resistance
F	C	Ω	F	C	Ω	F	C	Ω	F	C	Ω
-40	-40	188,500	28.4	-2	29,730	96.8	36	6,700	165.2	74	1,980
-38.2	-39	178,500	30.2	-1	28,480	98.6	37	6,470	167	75	1,920
-36.4	-38	169,000	32	0	27,280	100.4	38	6,250	168.8	76	1,870
-34.6	-37	160,200	33.8	1	26,130	102.2	39	6,030	170.6	77	1,820
-32.8	-36	151,900	35.6	2	25,030	104	40	5,830	172.4	78	1,770
-31	-35	144,100	37.4	3	23,990	105.8	41	5,630	174.2	79	1,920
-29.2	-34	136,700	39.2	4	23,000	107.6	42	5,440	176	80	1,670
-27.4	-33	129,800	41	5	22,050	109.4	43	5,260	177.8	81	1,620
-25.6	-32	123,300	42.8	6	21,150	111.2	44	5,080	179.6	82	1,580
-23.8	-31	117,100	44.6	7	20,300	113	45	4,910	181.4	83	1,530
-22	-30	111,300	46.4	8	19,480	114.8	46	4,750	183.2	84	1,490
-20.2	-29	105,700	48.2	9	18,700	116.6	47	4,590	185	85	1,450
-18.4	-28	100,500	50	10	17,960	118.4	48	4,440	186.8	86	1,441
-16.6	-27	95,520	51.8	11	17,240	120.2	49	4,300	188.6	87	1,370
-14.8	-26	90,840	53.6	12	16,560	122	50	4,160	190.4	88	1,340
-13	-25	86,430	55.4	13	15,900	123.8	51	4,030	192.2	89	1,300
-11.2	-24	82,260	57.2	14	15,280	125.6	52	3,900	194	90	1,270
-9.4	-23	78,330	59	15	14,690	127.4	53	3,770	195.8	91	1,230
-7.6	-22	74,610	60.8	16	14,120	129.2	54	3,650	197.6	92	1,200
-5.8	-21	71,100	62.6	17	13,580	131	55	3,540	199.4	93	1,170
-4	-20	67,770	64.4	18	13,060	132.8	56	3,430	201.2	94	1,140
-2.2	-19	64,570	66.2	19	12,560	134.6	57	3,320	203	95	1,110
-0.4	-18	61,540	68	20	12,090	136.4	58	3,220	204.8	96	1,080
1.4	-17	58,680	69.8	21	11,630	138.2	59	3,120	206.6	97	1,050
3.2	-16	55,970	71.6	22	11,200	140	60	3,020	208.4	98	1,020
5	-15	53,410	73.4	23	10,780	141.8	61	2,930	210.2	99	1,000
6.8	-14	50,980	75.2	24	10,380	143.6	62	2,840	212	100	970
8.6	-13	48,680	77	25	10,000	145.4	63	2,750			
10.4	-12	46,500	78.8	26	9,630	147.2	64	2,670			
12.2	-11	44,430	80.6	27	9,280	149	65	2,590			
14	-10	42,470	82.4	28	8,940	150.8	66	2,510			
15.8	-9	40,570	84.2	29	8,620	152.6	67	2,440			
17.6	-8	38,770	86	30	8,310	154.4	68	2,360			
19.4	-7	37,060	87.8	31	8,010	156.2	69	2,300			
21.2	-6	35,440	89.6	32	7,730	158	70	2,230			
23	-5	33,900	91.4	33	7,450	159.8	71	2,160			
24.8	-4	32,440	93.2	34	7,190	161.6	72	2,100			
26.6	-3	31,050	95	35	6,940	163.4	73	2,040			

Heat Pump Cooling Mode Circuit Diagram



MIS-3959

Heat Pump Dehumidification Mode Circuit Diagram



MIS-4065

W24HBD Cooling and Dehumidification Application Data[1]

DB/WB[2]	OD Temp.	65°F[3]		70°F		75°F		80°F		85°F		90°F		95°F		100°F		105°F	
	Mode	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum
75/62.5 (50% RH)	Total Cooling Btuh	27,800	16,400	27,000	14,800	26,000	13,200	25,100	11,500	24,100	9,700	23,100	7,700	22,000	5,700	20,800	3,600	19,600	1,500
	Sensible Btuh	20,700	8,200	20,400	7,000	20,200	5,800	19,700	4,600	19,300	3,300	18,900	2,000	18,400	700	17,900	(700)	17,300	(2,100)
	S/T	0.745	0.500	0.756	0.473	0.777	0.439	0.785	0.400	0.801	0.340	0.818	0.260	0.836	0	0.861	0	0.883	0
	Latent Btuh	7,100	8,200	6,600	7,800	5,800	7,400	5,400	6,900	4,800	6,400	4,200	5,700	3,600	5,000	2,900	4,300	2,300	3,600
	Lbs. H20/hr.	6.7	7.7	6.2	7.4	5.5	7.0	5.1	6.5	4.5	6.0	4.0	5.4	3.4	4.7	2.7	4.1	2.2	3.4
	Supply Air DB	51.0	61.2	51.5	63.3	52.0	65.3	52.5	67.5	53.1	69.6	53.6	71.8	54.2	74.0	54.7	76.2	55.3	78.4
	Supply Air WB	50.1	52.2	50.6	53.3	51.0	54.4	51.6	55.6	52.1	56.8	52.6	58.0	53.1	59.2	53.7	60.4	54.2	61.7
	Suction PSIG[4]	123	116	124	119	126	121	128	124	130	127	132	130	135	133	137	136	140	139
	Discharge PSIG[4]	264	246	284	261	305	277	327	294	349	311	373	329	398	347	424	365	451	385
75/64.1 (55% RH)	Total Cooling Btuh	28,700	16,800	27,800	15,300	26,900	13,600	26,000	11,900	25,000	10,100	23,900	8,200	22,800	6,200	21,700	4,100	20,500	1,900
	Sensible Btuh	19,500	7,400	19,200	6,200	18,900	5,000	18,600	3,700	18,200	2,500	17,700	1,200	17,200	(200)	16,700	(1,500)	16,100	(2,900)
	S/T	0.679	0.44	0.691	0.41	0.703	0.37	0.715	0.31	0.728	0.25	0.741	0.15	0.754	0	0.770	0	0.785	0
	Latent Btuh	9,200	9,400	8,600	9,100	8,000	8,600	7,400	8,200	6,800	7,600	6,200	7,000	5,600	6,400	5,000	5,600	4,400	4,800
	Lbs. H20/hr.	8.7	8.9	8.1	8.6	7.5	8.1	7.0	7.7	6.4	7.2	5.8	6.6	5.3	6.0	4.7	5.3	4.2	4.5
	Supply Air DB	52.3	62.6	52.8	64.7	53.3	66.7	53.8	68.9	54.3	71.0	54.8	73.2	55.4	75.4	55.9	77.6	56.5	79.8
	Supply Air WB	51.5	53.6	51.9	54.8	52.4	55.9	52.9	57.1	53.4	58.3	53.9	59.4	54.4	60.7	55.0	61.9	55.5	63.1
	Suction PSIG[4]	126	118	128	120	129	123	131	126	133	128	135	131	138	134	140	137	143	140
	Discharge PSIG[4]	265	247	285	263	306	279	328	295	351	312	375	330	400	348	426	367	452	386
75/65.5 (60% RH)	Total Cooling Btuh	29,600	17,300	28,700	15,700	27,700	14,100	26,900	12,400	25,800	10,500	24,800	8,600	23,700	6,600	22,600	4,500	21,400	2,400
	Sensible Btuh	18,300	6,500	18,100	5,400	17,900	4,200	17,400	2,900	17,000	1,600	16,600	300	16,100	(1,000)	15,500	(2,300)	15,000	(3,700)
	S/T	0.618	0.376	0.631	0.344	0.646	0.298	0.647	0.234	0.659	0.152	0.669	0.035	0.679	0	0.686	0	0.701	0
	Latent Btuh	11,300	10,800	10,600	10,300	9,800	9,900	9,500	9,500	8,800	8,900	8,200	8,300	7,600	7,600	7,100	6,800	6,400	6,100
	Lbs. H20/hr.	10.7	10.2	10.0	9.7	9.2	9.3	9.0	9.0	8.3	8.4	7.7	7.8	7.2	7.2	6.7	6.4	6.0	5.8
	Supply Air DB	53.5	64.0	54.0	66.1	54.5	68.1	55.0	70.2	55.5	72.4	56.1	74.6	56.6	76.7	57.2	79.0	57.8	81.2
	Supply Air WB	52.8	55.1	53.2	56.2	53.7	57.3	54.2	58.5	54.7	59.7	55.2	60.9	55.8	62.1	56.3	63.3	56.8	64.6
	Suction PSIG4	130	119	131	122	133	124	135	127	137	130	139	133	141	136	144	139	146	142
	Discharge PSIG4	267	249	287	264	308	280	330	297	352	314	376	331	401	349	427	368	454	387
75/66.7 (65% RH)	Total Cooling Btuh	30,500	17,700	29,600	16,200	28,600	14,600	27,700	12,800	26,700	11,000	25,700	9,100	24,600	7,100	23,400	5,000	22,200	2,800
	Sensible Btuh	17,200	5,700	16,900	4,500	16,700	3,400	16,200	2,100	15,800	800	15,400	(500)	14,900	(1,800)	14,400	(3,200)	13,800	(4,600)
	S/T	0.564	0.32	0.571	0.28	0.584	0.23	0.585	0.16	0.592	0.07	0.599	0	0.606	0	0.615	0	0.622	0
	Latent Btuh	13,300	12,000	12,700	11,700	11,900	11,200	11,500	10,700	10,900	10,200	10,300	9,600	9,700	8,900	9,000	8,200	8,400	7,400
	Lbs. H20/hr.	12.5	11.3	12.0	11.0	11.2	10.6	10.8	10.1	10.3	9.6	9.7	9.1	9.2	8.4	8.5	7.7	7.9	7.0
	Supply Air DB	54.8	65.4	55.3	67.4	55.7	69.5	56.3	71.6	56.8	73.8	57.3	75.9	57.9	78.1	58.4	80.4	59.0	82.6
	Supply Air WB	54.1	56.5	54.6	57.7	55.0	58.7	55.5	60.0	56.0	61.2	56.6	62.4	57.1	63.6	57.6	64.8	58.2	66.0
	Suction PSIG[4]	133	121	134	124	136	126	138	129	140	132	142	135	145	138	147	141	150	144
	Discharge PSIG[4]	268	250	288	265	309	281	331	298	354	315	378	332	403	351	429	369	455	389
75/68 (70% RH)	Total Cooling Btuh	31,300	18,200	30,500	16,600	29,500	15,000	28,600	13,200	27,600	11,400	26,500	9,500	25,400	7,500	24,300	5,400	23,100	3,200
	Sensible Btuh	16,000	4,900	15,700	3,700	15,500	2,500	15,000	1,300	14,600	-	14,200	(1,300)	13,700	(2,600)	13,200	(4,000)	12,600	(5,400)
	S/T	0.511	0.269	0.515	0.223	0.525	0.167	0.524	0.098	0.529	0.000	0.536	0	0.539	0	0.543	0	0.545	0
	Latent Btuh	15,300	13,300	14,800	12,900	14,000	12,500	13,600	11,900	13,000	11,400	12,300	10,800	11,700	10,100	11,100	9,400	10,500	8,600
	Lbs. H20/hr.	14.4	12.5	14.0	12.2	13.2	11.8	12.8	11.2	12.3	10.8	11.6	10.2	11.0	9.5	10.5	8.9	9.9	8.1
	Supply Air DB	56.0	66.8	56.5	68.8	57.0	70.9	57.5	73.0	58.0	75.2	58.6	77.3	59.1	79.5	59.7	81.8	60.2	84.0
	Supply Air WB	55.4	58.0	55.9	59.1	56.3	60.2	56.9	61.4	57.4	62.6	57.9	63.8	58.4	65.0	58.9	66.2	59.5	67.5
	Suction PSIG[4]	136	123	138	125	140	128	141	131	143	133	146	136	148	139	150	142	153	145
	Discharge PSIG[4]	270	251	290	267	311	283	333	299	356	316	379	334	404	352	430	371	457	390
80/68.3 (55% RH)	Total Cooling Btuh	31,400	19,500	30,600	18,000	29,600	16,400	28,700	14,600	27,700	12,800	26,700	10,900	25,600	8,900	24,400	6,800	23,200	4,600
	Sensible Btuh	20,000	8,300	19,700	7,200	19,500	6,000	19,100	4,700	18,700	3,400	18,200	2,100	17,700	800	17,200	(600)	16,600	(1,900)
	S/T	0.637	0.43	0.644	0.40	0.659	0.37	0.666	0.32	0.675	0.27	0.682	0.19	0.691	0.09	0.705	0	0.716	0
	Latent Btuh	11,400	11,200	10,900	10,800	10,100	10,400	9,600	9,900	9,000	9,400	8,500	8,800	7,900	8,100	7,200	7,400	6,600	6,500
	Lbs. H20/hr.	10.8	10.6	10.3	10.2	9.5	9.8	9.1	9.3	8.5	8.9	8.0	8.3	7.5	7.6	6.8	7.0	6.2	6.1
	Supply Air DB	56.4	66.1	56.9	68.2	57.3	70.2	57.9	72.4	58.4	74.5	58.9	76.7	59.5	78.9	60.0	81.1	60.6	83.3
	Supply Air WB	55.5	57.1	56.0	58.2	56.4	59.3	57.0	60.5	57.5	61.7	58.0	62.9	58.5	64.1	59.0	65.3	59.6	66.6
	Suction PSIG[4]	137	127	138	130	140	132	142	135	144	138	146	141	149	144	151	147	154	150
	Discharge PSIG[4]	270	255	289	271	310	287	332	303	355	320	379	338	404	356	430	375	457	394

[1] Values listed are with ventilation package disabled

[2] Return air temperature °F @ Default airflow (800 CFM) for AC tests and Balanced Climate airflow (560 CFM) for dehumidification tests

[3] Below 50°F, unit requires a factory or field installed low ambient control.

[4] Suction pressure +/- 4 psi, Discharge pressure +/- 10 psi

W30HBD Cooling and Dehumidification Application Data[1]

DB/WB[2]	OD Temp.	65°F[3]		70°F		75°F		80°F		85°F		90°F		95°F		100°F		105°F	
	Mode	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum
75/62.5 (50% RH)	Total Cooling Btuh	32,400	15,600	31,500	13,600	30,200	11,200	29,700	9,400	28,800	7,100	27,900	4,800	27,000	2,300	26,100		25,200	
	Sensible Btuh	24,300	6,100	23,900	4,200	23,500	2,400	23,100	600	22,700	(1,200)	22,300	(2,900)	22,000	(4,600)	21,600	(6,200)	21,400	(7,900)
	S/T	0.750	0.391	0.759	0.309	0.778	0.214	0.778	0.064	0.788	0	0.799	0	0.815	0	0.828	0	0.849	0
	Latent Btuh	8,100	9,500	7,600	9,400	6,700	8,800	6,600	8,800	6,100	8,300	5,600	7,700	5,000	6,900	4,500	6,000	3,800	5,000
	Lbs. H20/hr.	7.6	9.0	7.2	8.9	6.3	8.3	6.2	8.3	5.8	7.8	5.3	7.3	4.7	6.5	4.2	5.7	3.6	4.7
	Supply Air DB	53.0	67.2	53.5	69.6	53.6	72.0	54.3	74.2	54.6	76.5	55.0	78.7	55.3	80.9	55.5	83.0	55.7	85.2
	Supply Air WB	51.4	55.5	51.8	56.5	52.2	57.6	52.5	58.4	52.9	59.5	53.2	60.5	53.5	61.6	53.8	62.7	54.1	63.9
	Suction PSIG[4]	127	120	128	121	128	122	130	123	132	125	133	127	135	129	138	131	140	134
	Discharge PSIG[4]	278	238	298	251	319	265	342	280	365	295	390	311	415	328	442	345	470	363
75/64.1 (55% RH)	Total Cooling Btuh	33,500	16,500	32,600	14,600	31,700	12,500	30,800	10,400	29,900	8,100	29,000	5,800	28,100	3,300	27,200	700	26,300	
	Sensible Btuh	23,100	5,500	22,600	3,600	22,200	1,800	21,800	-	21,400	(1,800)	21,100	(3,500)	20,700	(5,200)	20,400	(6,900)	20,100	(8,500)
	S/T	0.690	0.33	0.693	0.25	0.700	0.14	0.708	0.00	0.716	0	0.728	0	0.737	0	0.750	0	0.764	0
	Latent Btuh	10,400	11,000	10,000	11,000	9,500	10,700	9,000	10,400	8,500	9,900	7,900	9,300	7,400	8,500	6,800	7,600	6,200	6,600
	Lbs. H20/hr.	9.8	10.4	9.4	10.4	9.0	10.1	8.5	9.8	8.0	9.3	7.5	8.8	7.0	8.0	6.4	7.2	5.8	6.2
	Supply Air DB	54.1	68.0	54.5	70.4	55.0	72.7	55.4	75.0	55.7	77.3	56.0	79.5	56.3	81.7	56.6	83.9	56.8	86.0
	Supply Air WB	52.7	56.7	53.1	57.6	53.5	58.5	53.8	59.5	54.2	60.6	54.5	61.6	54.8	62.7	55.1	63.8	55.4	65.0
	Suction PSIG[4]	131	124	132	124	133	125	134	126	136	128	137	130	139	132	142	134	144	137
	Discharge PSIG[4]	280	241	300	254	321	268	344	283	367	298	392	314	418	331	444	348	472	365
75/65.5 (60% RH)	Total Cooling Btuh	34,600	17,500	33,700	15,600	32,400	13,100	31,900	11,400	31,000	9,100	30,100	6,700	29,200	4,300	28,300	1,700	27,300	
	Sensible Btuh	21,800	4,800	21,400	3,000	21,000	1,100	20,600	(700)	20,200	(2,400)	19,800	(4,100)	19,500	(5,800)	19,200	(7,500)	18,900	(9,100)
	S/T	0.630	0.274	0.635	0.192	0.648	0.084	0.646	0	0.652	0	0.658	0	0.668	0	0.678	0	0.692	0
	Latent Btuh	12,800	12,700	12,300	12,600	11,400	12,000	11,300	12,100	10,800	11,500	10,300	10,800	9,700	10,100	9,100	9,200	8,400	8,200
	Lbs. H20/hr.	12.1	12.0	11.6	11.9	10.8	11.3	10.7	11.4	10.2	10.8	9,7	10.2	9,2	9,5	8.6	8.7	7.9	7.7
	Supply Air DB	55.1	68.9	55.6	71.2	55.7	73.6	56.4	75.9	56.8	78.1	57.1	80.3	57.4	82.5	57.6	84.7	57.9	86.8
	Supply Air WB	54.1	57.8	54.4	58.7	54.8	59.8	55.2	60.7	55.5	61.7	55.8	62.7	56.1	63.8	56.4	65.0	56.7	66.1
	Suction PSIG4	135	127	136	128	136	129	138	130	139	131	141	133	143	135	146	138	148	140
	Discharge PSIG4	282	243	302	257	323	271	346	286	369	301	394	317	420	334	446	351	474	368
75/66.7 (65% RH)	Total Cooling Btuh	35,700	18,500	34,800	16,500	33,400	14,100	33,000	12,300	32,100	10,100	31,200	7,700	30,300	5,300	29,300	2,700	28,400	-
	Sensible Btuh	20,600	4,200	20,200	2,300	19,800	500	19,300	(1,300)	18,900	(3,000)	18,600	(4,800)	18,200	(6,500)	17,900	(8,100)	17,600	(9,700)
	S/T	0.577	0.23	0.580	0.14	0.593	0.04	0.585	0	0.589	0	0.596	0	0.601	0	0.611	0	0.620	#DIV/0!
	Latent Btuh	15,100	14,300	14,600	14,200	13,600	13,600	13,700	13,600	13,200	13,100	12,600	12,500	12,100	11,800	11,400	10,800	10,800	9,700
	Lbs. H20/hr.	14.2	13.5	13.8	13.4	12.8	12.8	12.9	12.8	12.5	12.4	11.9	11.8	11.4	11.1	10.8	10.2	10.2	9.2
	Supply Air DB	56.2	69.7	56.7	72.1	56.8	74.4	57.5	76.7	57.9	78.9	58.2	81.2	58.5	83.4	58.7	85.5	58.9	87.6
	Supply Air WB	55.4	58.9	55.8	59.8	56.1	60.9	56.5	61.8	56.8	62.8	57.1	63.8	57.5	64.9	57.8	66.1	58.1	67.2
	Suction PSIG[4]	139	130	140	131	140	132	142	133	143	134	145	136	147	138	149	141	152	144
	Discharge PSIG[4]	284	246	304	260	325	274	348	289	371	304	396	320	422	336	448	353	476	371
75/68 (70% RH)	Total Cooling Btuh	36,700	19,500	35,900	17,500	34,500	15,100	34,100	13,300	33,200	11,100	32,300	8,700	31,300	6,200	30,400	3,700	29,500	1,000
	Sensible Btuh	19,400	3,600	18,900	1,700	18,500	(100)	18,100	(1,900)	17,700	(3,700)	17,300	(5,400)	17,000	(7,100)	16,700	(8,800)	16,400	(10,400)
	S/T	0.529	0.185	0.526	0.097	0.536	0	0.531	0	0.533	0	0.536	0	0.543	0	0.549	0	0.556	0
	Latent Btuh	17,300	15,900	17,000	15,800	16,000	15,200	16,000	15,200	15,500	14,800	15,000	14,100	14,300	13,300	13,700	12,500	13,100	11,400
	Lbs. H20/hr.	16.3	15.0	16.0	14.9	15.1	14.3	15.1	14.3	14.6	14.0	14.2	13.3	13.5	12.5	12.9	11.8	12.4	10.8
	Supply Air DB	57.3	70.5	57.7	72.9	57.9	75.3	58.6	77.5	58.9	79.8	59.3	82.0	59.5	84.2	59.8	86.3	60.0	88.5
	Supply Air WB	56.7	60.0	57.1	60.9	57.4	62.0	57.8	62.9	58.1	63.9	58.5	64.9	58.8	66.0	59.1	67.2	59.4	68.3
	Suction PSIG[4]	143	134	144	134	144	135	146	136	147	138	149	140	151	142	153	144	156	147
	Discharge PSIG[4]	286	249	306	263	327	277	350	292	373	307	398	323	424	339	450	356	478	374
80/68.3 (55% RH)	Total Cooling Btuh	37,400	19,700	36,500	17,800	35,200	15,300	34,700	13,600	33,800	11,300	32,900	8,900	32,000	6,500	31,100	3,900	30,200	1,300
	Sensible Btuh	24,300	7,000	23,900	5,100	23,500	3,300	23,000	1,500	22,700	(300)	22,300	(2,000)	22,000	(3,700)	21,600	(5,300)	21,300	(7,000)
	S/T	0.650	0.36	0.655	0.29	0.668	0.22	0.663	0.11	0.672	0	0.678	0	0.688	0	0.695	0	0.705	0
	Latent Btuh	13,100	12,700	12,600	12,700	11,700	12,000	11,700	12,100	11,100	11,600	10,600	10,900	10,000	10,200	9,500	9,200	8,900	8,300
	Lbs. H20/hr.	12.4	12.0	11.9	12.0	11.0	11.3	11.0	11.4	10.5	10.9	10.0	10.3	9.4	9.6	9.0	8.7	8.4	7.8
	Supply Air DB	58.2	71.0	58.6	73.4	58.8	75.7	59.5	78.0	59.8	80.2	60.1	82.5	60.4	84.7	60.7	86.8	60.9	88.9
	Supply Air WB	56.7	60.1	57.1	61.0	57.5	62.1	57.8	63.0	58.2	64.0	58.5	65.1	58.8	66.2	59.1	67.3	59.4	68.4
	Suction PSIG[4]	145	134	146	134	146	135	148	136	150	138	152	140	154	142	156	144	158	147
	Discharge PSIG[4]	286	249	306	263	327	277	350	292	373	307	398	323	423	339	450	357	478	374

[1] Values listed are with ventilation package disabled

[2] Return air temperature °F @ Default airflow (1000 CFM) for AC tests and Balanced Climate airflow (700 CFM) for dehumidification tests

[3] Below 50°F, unit requires a factory or field installed low ambient control.

[4] Suction pressure +/- 4 psi, Discharge pressure +/- 10 psi

W36HBD Cooling and Dehumidification Application Data[1]

DB/WB[2]	OD Temp.	65°F[3]		70°F		75°F		80°F		85°F		90°F		95°F		100°F		105°F	
	Mode	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum
75/62.5 (50% RH)	Total Cooling Btuh	40,200	18,100	39,200	15,400	35,400	12,400	36,500	10,000	36,000	7,200	34,800	4,500	33,600	1,600	32,400		31,200	
	Sensible Btuh	29,800	7,400	29,400	5,400	28,900	3,500	27,700	1,400	27,900	(500)	27,400	(2,500)	26,800	(4,400)	26,300	(6,300)	25,700	(8,200)
	S/T	0.741	0.409	0.750	0.351	0.816	0.282	0.759	0.140	0.775	0	0.787	0	0.798	0	0.812	0	0.824	0
	Latent Btuh	10,400	10,700	9,800	10,000	6,500	8,900	8,800	8,600	8,100	7,700	7,400	7,000	6,800	6,000	6,100	5,100	5,500	4,100
	Lbs. H20/hr.	9.8	10.1	9.2	9.4	6.1	8.4	8.3	8.1	7.6	7.3	7.0	6.6	6.4	5.7	5.8	4.8	5.2	3.9
	Supply Air DB	51.2	67.0	51.6	69.2	53.1	71.4	52.7	73.7	52.8	75.9	53.2	78.1	53.6	80.2	54.0	82.4	54.4	84.5
	Supply Air WB	50.1	55.2	50.5	56.4	51.4	57.5	51.2	58.7	51.6	59.8	52.0	61.0	52.4	62.1	52.8	63.2	53.2	64.2
	Suction PSIG[4]	126	117	127	119	128	120	129	122	130	124	132	126	133	129	135	131	137	134
	Discharge PSIG[4]	276	245	296	259	317	272	339	288	361	303	385	318	409	334	434	351	459	367
75/64.1 (55% RH)	Total Cooling Btuh	40,500	19,300	39,500	16,600	38,500	13,900	37,400	11,200	36,300	8,400	35,100	5,600	33,900	2,800	32,700		31,400	
	Sensible Btuh	27,900	6,700	27,400	4,600	26,900	2,600	26,400	600	25,900	(1,300)	25,400	(3,300)	24,900	(5,200)	24,300	(7,100)	23,700	(9,000)
	S/T	0.689	0.35	0.694	0.28	0.699	0.19	0.706	0.05	0.713	0	0.724	0	0.735	0	0.743	0	0.755	0
	Latent Btuh	12,600	12,600	12,100	12,000	11,600	11,300	11,000	10,600	10,400	9,700	9,700	8,900	9,000	8,000	8,400	7,100	7,700	6,100
	Lbs. H20/hr.	11.9	11.9	11.4	11.3	10.9	10.7	10.4	10.0	9.8	9.2	9.2	8.4	8.5	7.5	7.9	6.7	7.3	5.8
	Supply Air DB	52.8	67.9	53.2	70.2	53.6	72.4	53.9	74.6	54.3	76.8	54.8	79.0	55.2	81.2	55.6	83.3	56.0	85.5
	Supply Air WB	51.7	56.2	52.1	57.4	52.4	58.6	52.8	59.8	53.2	60.9	53.6	62.0	54.0	63.1	54.3	64.2	54.7	65.3
	Suction PSIG[4]	130	121	131	122	132	124	133	126	134	128	135	130	137	132	138	135	140	137
	Discharge PSIG[4]	277	248	297	262	318	276	340	291	362	306	386	321	410	337	435	354	460	371
75/65.5 (60% RH)	Total Cooling Btuh	40,800	20,500	39,800	17,800	36,000	14,800	37,100	12,400	36,600	9,600	35,400	6,800	34,200	4,000	33,000	1,100	31,700	
	Sensible Btuh	25,900	5,900	25,400	3,800	25,000	2,000	23,800	(100)	24,000	(2,100)	23,500	(4,100)	22,900	(6,000)	22,300	(7,900)	21,800	(9,800)
	S/T	0.635	0.288	0.638	0.213	0.694	0.135	0.642	0	0.656	0	0.664	0	0.670	0	0.676	0	0.688	0
	Latent Btuh	14,900	14,600	14,400	14,000	11,000	12,800	13,300	12,500	12,600	11,700	11,900	10,900	11,300	10,000	10,700	9,000	9,900	8,100
	Lbs. H20/hr.	14.1	13.8	13.6	13.2	10.4	12.1	12.5	11.8	11.9	11.0	11.2	10.3	10.7	9.4	10.1	8.5	9.3	7.6
	Supply Air DB	54.4	68.9	54.7	71.1	56.3	73.3	55.9	75.6	55.9	77.8	56.3	80.0	56.7	82.1	57.2	84.3	57.6	86.4
	Supply Air WB	53.3	57.3	53.6	58.5	54.5	59.6	54.4	60.8	54.8	62.0	55.1	63.1	55.5	64.2	55.9	65.3	56.3	66.3
	Suction PSIG4	133	124	134	126	135	127	136	129	137	131	139	133	140	136	142	138	144	141
	Discharge PSIG4	278	251	298	265	319	278	341	294	364	309	387	324	411	340	436	357	461	374
75/66.7 (65% RH)	Total Cooling Btuh	41,100	21,600	40,100	19,000	36,300	15,900	37,300	13,500	36,900	10,800	35,700	8,000	34,500	5,200	33,300	2,300	32,000	
	Sensible Btuh	23,900	5,100	23,500	3,100	23,000	1,200	21,800	(900)	22,000	(2,900)	21,500	(4,800)	20,900	(6,800)	20,400	(8,700)	19,800	(10,600)
	S/T	0.582	0.24	0.586	0.16	0.634	0.08	0.584	0	0.596	0	0.602	0	0.606	0	0.613	0	0.619	0
	Latent Btuh	17,200	16,500	16,600	15,900	13,300	14,700	15,500	14,400	14,900	13,700	14,200	12,800	13,600	12,000	12,900	11,000	12,200	10,000
	Lbs. H20/hr.	16.2	15.6	15.7	15.0	12.5	13.9	14.6	13.6	14.1	12.9	13.4	12.1	12.8	11.3	12.2	10.4	11.5	9.4
	Supply Air DB	55.9	69.8	56.3	72.1	57.9	74.2	57.5	76.5	57.5	78.7	57.9	80.9	58.3	83.1	58.7	85.2	59.2	87.4
	Supply Air WB	54.8	58.4	55.2	59.5	56.1	60.6	56.0	61.9	56.3	63.0	56.7	64.1	57.1	65.2	57.5	66.3	57.9	67.4
	Suction PSIG[4]	137	128	138	129	139	131	140	133	141	135	142	137	144	139	145	142	147	144
	Discharge PSIG[4]	279	254	299	268	320	282	342	297	365	312	388	328	412	343	437	360	462	377
75/68 (70% RH)	Total Cooling Btuh	41,400	22,800	40,400	20,100	36,600	17,100	37,600	14,700	37,100	11,900	36,000	9,200	34,800	6,300	33,600	3,500	32,300	600
	Sensible Btuh	22,000	4,300	21,500	2,300	21,100	400	19,900	(1,700)	20,100	(3,700)	19,500	(5,600)	19,000	(7,500)	18,400	(9,400)	17,800	(11,300)
	S/T	0.531	0.189	0.532	0.114	0.577	0.023	0.529	0	0.542	0	0.542	0	0.546	0	0.548	0	0.551	0
	Latent Btuh	19,400	18,500	18,900	17,800	15,500	16,700	17,700	16,400	17,000	15,600	16,500	14,800	15,800	13,800	15,200	12,900	14,500	11,900
	Lbs. H20/hr.	18.3	17.5	17.8	16.8	14.6	15.8	16.7	15.5	16.0	14.7	15.6	14.0	14.9	13.0	14.3	12.2	13.7	11.2
	Supply Air DB	57.5	70.8	57.9	73.0	59.4	75.2	59.0	77.5	59.1	79.7	59.5	81.9	59.9	84.1	60.3	86.2	60.7	88.3
	Supply Air WB	56.4	59.4	56.8	60.6	57.6	61.7	57.5	62.9	57.9	64.1	58.3	65.2	58.7	66.3	59.1	67.4	59.4	68.5
	Suction PSIG[4]	141	132	141	133	142	134	143	136	144	138	146	141	147	143	149	145	151	148
	Discharge PSIG[4]	280	257	300	271	321	285	343	300	366	315	389	331	413	347	438	363	464	380
80/68.3 (55% RH)	Total Cooling Btuh	46,200	23,600	45,200	20,900	41,300	17,900	42,400	15,500	41,900	12,700	40,800	9,900	39,600	7,100	38,400	4,300	37,100	1,400
	Sensible Btuh	28,500	8,200	28,000	6,100	27,500	4,300	26,400	2,200	26,600	200	26,000	(1,800)	25,500	(3,700)	24,900	(5,600)	24,300	(7,500)
	S/T	0.617	0.35	0.619	0.29	0.666	0.24	0.623	0.14	0.635	0.02	0.637	0	0.644	0	0.648	0	0.655	0
	Latent Btuh	17,700	15,400	17,200	14,800	13,800	13,600	16,000	13,300	15,300	12,500	14,800	11,700	14,100	10,800	13,500	9,900	12,800	8,900
	Lbs. H20/hr.	16.7	14.5	16.2	14.0	13.0	12.8	15.1	12.5	14.4	11.8	14.0	11.0	13.3	10.2	12.7	9.3	12.1	8.4
	Supply Air DB	55.9	71.3	56.3	73.5	57.8	75.7	57.4	78.0	57.4	80.2	57.9	82.4	58.3	84.5	58.7	86.7	59.1	88.8
	Supply Air WB	55.4	59.4	55.8	60.6	56.6	61.7	56.5	62.9	56.9	64.1	57.3	65.2	57.7	66.3	58.1	67.4	58.5	68.5
	Suction PSIG[4]	141	132	142	133	143	135	144	137	145	139	146	141	148	143	149	146	151	149
	Discharge PSIG[4]	279	256	300	270	321	284	343	299	365	314	389	330	413	346	437	362	463	379

[1] Values listed are with ventilation package disabled

[2] Return air temperature °F @ Default airflow (1100 CFM) for AC tests and Balanced Climate airflow (800 CFM) for dehumidification tests

[3] Below 50°F, unit requires a factory or field installed low ambient control.

[4] Suction pressure +/- 4 psi, Discharge pressure +/- 10 psi

W42HCD Cooling and Dehumidification Application Data[1]

DB/WB[2]	OD Temp.	65°F[3]		70°F		75°F		80°F		85°F		90°F		95°F		100°F		105°F	
	Mode	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum
75/62.5 (50% RH)	Total Cooling Btuh	47,200	21,800	45,800	18,400	44,200	15,500	42,900	12,000	41,500	8,900	40,000	5,900	38,500	3,000	37,000	100	35,400	
	Sensible Btuh	34,700	8,600	34,000	6,400	33,400	4,200	32,700	1,900	32,100	(300)	31,500	(2,500)	30,900	(4,800)	30,300	(7,000)	29,700	(9,300)
	S/T	0.735	0.394	0.742	0.348	0.756	0.271	0.762	0.158	0.773	0	0.788	0	0.803	0	0.819	0	0.839	0
	Latent Btuh	12,500	13,200	11,800	12,000	10,800	11,300	10,200	10,100	9,400	9,200	8,500	8,400	7,600	7,800	6,700	7,100	5,700	6,600
	Lbs. H20/hr.	11.8	12.5	11.1	11.3	10.2	10.7	9.6	9.5	8.9	8.7	8.0	7.9	7.2	7.4	6.3	6.7	5.4	6.2
	Supply Air DB	51.7	66.7	52.1	68.9	52.5	71.0	53.0	73.3	53.4	75.4	53.9	77.6	54.3	79.7	54.7	81.8	55.2	83.9
	Supply Air WB	50.4	55.0	50.8	56.2	51.1	57.2	51.6	58.5	52.0	59.6	52.4	60.6	52.8	61.6	53.2	62.6	53.7	63.5
	Suction PSIG[4]	123	113	124	115	124	117	126	119	128	121	130	123	131	126	133	128	135	131
	Discharge PSIG[4]	276	248	296	262	315	277	339	292	362	308	387	325	412	341	439	359	466	377
75/64.1 (55% RH)	Total Cooling Btuh	48,500	23,400	47,100	20,100	45,700	16,800	44,200	13,700	42,800	10,600	41,300	7,600	39,800	4,600	38,300	1,700	36,700	
	Sensible Btuh	32,900	7,600	32,200	5,400	31,500	3,200	30,800	1,000	30,200	(1,200)	29,600	(3,500)	29,000	(5,700)	28,400	(8,000)	27,800	(10,200)
	S/T	0.678	0.32	0.684	0.27	0.689	0.19	0.697	0.07	0.706	0	0.717	0	0.729	0	0.742	0	0.757	0
	Latent Btuh	15,600	15,800	14,900	14,700	14,200	13,600	13,400	12,700	12,600	11,800	11,700	11,100	10,800	10,300	9,900	9,700	8,900	9,100
	Lbs. H20/hr.	14.7	14.9	14.1	13.9	13.4	12.8	12.6	12.0	11.9	11.1	11.0	10.5	10.2	9.7	9.3	9.2	8.4	8.6
	Supply Air DB	52.9	67.6	53.3	69.8	53.8	72.0	54.2	74.2	54.6	76.4	55.1	78.5	55.5	80.6	56.0	82.8	56.4	84.9
	Supply Air WB	51.8	56.0	52.2	57.2	52.6	58.4	53.0	59.5	53.4	60.6	53.8	61.7	54.2	62.7	54.6	63.6	55.0	64.6
	Suction PSIG[4]	126	116	127	118	128	120	130	122	131	124	133	126	135	129	136	131	138	134
	Discharge PSIG[4]	278	251	297	265	318	280	341	295	364	311	388	327	414	344	440	362	468	379
75/65.5 (60% RH)	Total Cooling Btuh	49,800	25,000	48,400	21,700	46,800	18,700	45,500	15,300	44,100	12,200	42,600	9,200	41,100	6,200	39,600	3,400	38,000	600
	Sensible Btuh	31,000	6,700	30,300	4,500	29,600	2,300	29,000	-	28,300	(2,200)	27,700	(4,400)	27,100	(6,700)	26,500	(8,900)	26,000	(11,200)
	S/T	0.622	0.268	0.626	0.207	0.632	0.123	0.637	0.000	0.642	0	0.650	0	0.659	0	0.669	0	0.684	0
	Latent Btuh	18,800	18,300	18,100	17,200	17,200	16,400	16,500	15,300	15,800	14,400	14,900	13,600	14,000	12,900	13,100	12,300	12,000	11,800
	Lbs. H20/hr.	17.7	17.3	17.1	16.2	16.2	15.5	15.6	14.4	14.9	13.6	14.1	12.8	13.2	12.2	12.4	11.6	11.3	11.1
	Supply Air DB	54.1	68.5	54.6	70.7	54.9	72.9	55.4	75.1	55.9	77.3	56.3	79.4	56.7	81.6	57.2	83.7	57.6	85.8
	Supply Air WB	53.2	57.1	53.6	58.3	53.9	59.2	54.3	60.5	54.7	61.6	55.1	62.7	55.6	63.7	56.0	64.6	56.4	65.6
	Suction PSIG4	129	119	130	121	131	122	133	125	135	127	136	129	138	132	140	134	142	137
	Discharge PSIG4	279	253	299	268	318	282	342	298	366	314	390	330	415	347	442	364	470	382
75/66.7 (65% RH)	Total Cooling Btuh	51,100	26,700	49,700	23,400	48,100	20,400	46,800	16,900	45,400	13,800	43,900	10,800	42,400	7,900	40,900	5,000	39,300	2,200
	Sensible Btuh	29,100	5,700	28,400	3,500	27,800	1,300	27,100	(900)	26,500	(3,200)	25,800	(5,400)	25,200	(7,600)	24,700	(9,900)	24,100	(12,100)
	S/T	0.569	0.21	0.571	0.15	0.578	0.06	0.579	0	0.584	0	0.588	0	0.594	0	0.604	0	0.613	0
	Latent Btuh	22,000	21,000	21,300	19,900	20,300	19,100	19,700	17,800	18,900	17,000	18,100	16,200	17,200	15,500	16,200	14,900	15,200	14,300
	Lbs. H20/hr.	20.8	19.8	20.1	18.8	19.2	18.0	18.6	16.8	17.8	16.0	17.1	15.3	16.2	14.6	15.3	14.1	14.3	13.5
	Supply Air DB	55.4	69.5	55.8	71.7	56.1	73.8	56.6	76.0	57.1	78.2	57.5	80.3	58.0	82.5	58.4	84.6	58.8	86.7
	Supply Air WB	54.6	58.1	54.9	59.3	55.3	60.2	55.7	61.6	56.1	62.6	56.5	63.7	56.9	64.7	57.4	65.7	57.8	66.6
	Suction PSIG[4]	133	122	134	124	134	125	136	128	138	130	140	132	141	135	143	137	145	139
	Discharge PSIG[4]	281	256	301	271	320	285	344	301	367	317	392	333	417	350	444	367	472	385
75/68 (70% RH)	Total Cooling Btuh	52,400	28,300	51,000	25,000	49,400	22,000	48,100	18,600	46,700	15,500	45,200	12,500	43,700	9,500	42,200	6,600	40,600	3,900
	Sensible Btuh	27,200	4,800	26,600	2,600	25,900	400	25,200	(1,900)	24,600	(4,100)	24,000	(6,400)	23,400	(8,600)	22,800	(10,800)	22,200	(13,100)
	S/T	0.519	0.170	0.522	0.104	0.524	0.018	0.524	0	0.527	0	0.531	0	0.535	0	0.540	0	0.547	0
	Latent Btuh	25,200	23,500	24,400	22,400	23,500	21,600	22,900	20,500	22,100	19,600	21,200	18,900	20,300	18,100	19,400	17,400	18,400	17,000
	Lbs. H20/hr.	23.8	22.2	23.0	21.1	22.2	20.4	21.6	19.3	20.8	18.5	20.0	17.8	19.2	17.1	18.3	16.4	17.4	16.0
	Supply Air DB	56.6	70.4	57.0	72.6	57.3	74.7	57.9	77.0	58.3	79.1	58.7	81.3	59.2	83.4	59.6	85.5	60.1	87.6
	Supply Air WB	55.9	59.1	56.3	60.3	56.6	61.2	57.1	62.6	57.5	63.7	57.9	64.7	58.3	65.7	58.7	66.7	59.2	67.6
	Suction PSIG[4]	136	125	137	127	138	128	140	131	141	133	143	135	145	137	146	140	148	142
	Discharge PSIG[4]	283	259	303	273	321	288	346	304	369	319	393	336	419	353	445	370	473	388
80/68.3 (55% RH)	Total Cooling Btuh	52,800	28,400	51,500	25,100	49,900	22,200	48,600	18,700	47,200	15,600	45,700	12,600	44,200	9,700	42,700	6,800	41,100	4,000
	Sensible Btuh	33,800	9,500	33,200	7,300	32,500	5,100	31,800	2,800	31,200	600	30,600	(1,600)	30,000	(3,900)	29,400	(6,100)	28,800	(8,400)
	S/T	0.640	0.33	0.645	0.29	0.651	0.23	0.654	0.15	0.661	0.04	0.670	0	0.679	0	0.689	0	0.701	0
	Latent Btuh	19,000	18,900	18,300	17,800	17,400	17,100	16,800	15,900	16,000	15,000	15,100	14,200	14,200	13,600	13,300	12,900	12,300	12,400
	Lbs. H20/hr.	17.9	17.8	17.3	16.8	16.4	16.1	15.8	15.0	15.1	14.2	14.2	13.4	13.4	12.8	12.5	12.2	11.6	11.7
	Supply Air DB	57.1	70.8	57.5	73.0	57.9	75.1	58.4	77.3	58.8	79.5	59.3	81.6	59.7	83.8	60.2	85.9	60.6	88.0
	Supply Air WB	56.0	59.3	56.3	60.5	56.7	61.4	57.1	62.8	57.5	63.9	57.9	64.9	58.3	65.9	58.8	66.9	59.2	67.8
	Suction PSIG[4]	138	125	139	127	140	129	142	131	143	133	145	136	146	138	148	141	150	143
	Discharge PSIG[4]	284	258	304	273	322	287	347	303	370	319	394	335	420	352	447	369	474	387

[1] Values listed are with ventilation package disabled
[2] Return air temperature °F @ Default airflow (1350 CFM) for AC tests and Balanced Climate airflow (900 CFM) for dehumidification tests
[3] Below 50°F, unit requires a factory or field installed low ambient control.
[4] Suction pressure +/- 4 psi, Discharge pressure +/- 10 psi

W48HCD Cooling and Dehumidification Application Data[1]

DB/WB[2]	OD Temp.	65°F[3]		70°F		75°F		80°F		85°F		90°F		95°F		100°F		105°F	
	Mode	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum
75/62.5 (50% RH)	Total Cooling Btuh	53,500	26,200	51,500	23,200	49,700	19,700	47,700	16,800	45,800	13,300	44,000	9,600	42,200	5,800	40,400	1,800	38,700	
	Sensible Btuh	40,000	11,600	39,200	9,400	38,600	8,200	37,700	4,800	36,900	2,300	36,100	(200)	35,200	(2,800)	34,400	(5,600)	33,500	(8,400)
	S/T	0.748	0.443	0.761	0.405	0.777	0.416	0.790	0.286	0.806	0.173	0.820	0	0.834	0	0.851	0	0.866	0
	Latent Btuh	13,500	14,600	12,300	13,800	11,100	11,500	10,000	12,000	8,900	11,000	7,900	9,800	7,000	8,600	6,000	7,400	5,200	6,000
	Lbs. H20/hr.	12.7	13.8	11.6	13.0	10.5	10.8	9.4	11.3	8.4	10.4	7.5	9.2	6.6	8.1	5.7	7.0	4.9	5.7
	Supply Air DB	51.8	65.4	52.2	67.2	52.5	68.2	53.0	71.1	53.5	73.1	53.9	75.2	54.5	77.3	55.0	79.5	55.6	81.8
	Supply Air WB	50.8	54.6	51.2	55.6	51.5	55.6	51.9	57.7	52.4	58.7	52.8	59.8	53.3	60.9	53.8	62.0	54.4	63.2
	Suction PSIG[4]	128	118	129	119	131	118	132	122	133	123	134	125	136	127	137	129	139	131
	Discharge PSIG[4]	285	257	305	270	326	282	349	300	372	315	397	332	422	349	449	367	476	386
75/64.1 (55% RH)	Total Cooling Btuh	54,900	27,900	52,900	24,900	50,900	21,800	49,000	18,500	47,200	15,000	45,300	11,300	43,500	7,500	41,800	3,500	40,100	
	Sensible Btuh	37,700	10,300	37,000	8,100	36,200	5,800	35,400	3,500	34,600	1,000	33,800	(1,600)	33,000	(4,200)	32,100	(6,900)	31,200	(9,700)
	S/T	0.687	0.37	0.699	0.33	0.711	0.27	0.722	0.19	0.733	0.07	0.746	0	0.759	0	0.768	0	0.778	0
	Latent Btuh	17,200	17,600	15,900	16,800	14,700	16,000	13,600	15,000	12,600	14,000	11,500	12,900	10,500	11,700	9,700	10,400	8,900	9,000
	Lbs. H20/hr.	16.2	16.6	15.0	15.8	13.9	15.1	12.8	14.2	11.9	13.2	10.8	12.2	9.9	11.0	9.2	9.8	8.4	8.5
	Supply Air DB	53.1	66.5	53.4	68.3	53.8	70.2	54.2	72.2	54.7	74.2	55.2	76.3	55.7	78.4	56.3	80.6	56.9	82.9
	Supply Air WB	52.2	55.7	52.5	56.7	52.9	57.7	53.3	58.7	53.7	59.8	54.2	60.9	54.7	62.0	55.2	63.1	55.7	64.3
	Suction PSIG[4]	132	121	133	122	134	123	135	125	136	127	138	128	139	130	141	132	142	134
	Discharge PSIG[4]	287	261	307	274	329	288	351	303	375	319	399	335	424	352	451	370	478	389
75/65.5 (60% RH)	Total Cooling Btuh	56,300	29,500	54,300	26,600	52,400	23,100	50,400	20,100	48,500	16,700	46,700	13,000	44,900	9,200	43,100	5,200	41,400	1,000
	Sensible Btuh	35,500	8,900	34,700	6,700	34,100	5,500	33,200	2,100	32,400	(400)	31,600	(2,900)	30,700	(5,500)	29,900	(8,300)	29,000	(11,100)
	S/T	0.631	0.302	0.639	0.252	0.651	0.238	0.659	0.104	0.668	0	0.677	0	0.684	0	0.694	0	0.700	0
	Latent Btuh	20,800	20,600	19,600	19,900	18,300	17,600	17,200	18,000	16,100	17,100	15,100	15,900	14,200	14,700	13,200	13,500	12,400	12,100
	Lbs. H20/hr.	19.6	19.4	18.5	18.8	17.3	16.6	16.2	17.0	15.2	16.1	14.2	15.0	13.4	13.9	12.5	12.7	11.7	11.4
	Supply Air DB	54.3	67.6	54.7	69.4	55.0	70.4	55.5	73.3	55.9	75.3	56.4	77.4	57.0	79.5	57.5	81.7	58.1	84.0
	Supply Air WB	53.5	56.8	53.9	57.8	54.2	57.8	54.6	59.8	55.1	60.9	55.5	62.0	56.0	63.1	56.5	64.2	57.1	65.4
	Suction PSIG4	135	124	136	125	137	124	138	128	139	130	141	131	142	133	144	135	145	138
	Discharge PSIG4	289	264	309	277	331	289	353	307	377	322	401	339	427	356	453	374	480	393
75/66.7 (65% RH)	Total Cooling Btuh	57,600	31,200	55,600	28,300	53,800	24,800	51,800	21,800	49,900	18,300	48,100	14,700	46,300	10,900	44,500	6,900	42,800	2,700
	Sensible Btuh	33,200	7,600	32,500	5,400	31,900	4,200	30,900	700	30,100	(1,700)	29,300	(4,300)	28,500	(6,900)	27,600	(9,600)	26,700	(12,400)
	S/T	0.576	0.24	0.585	0.19	0.593	0.17	0.597	0.03	0.603	0	0.609	0	0.616	0	0.620	0	0.624	0
	Latent Btuh	24,400	23,600	23,100	22,900	21,900	20,600	20,900	21,100	19,800	20,000	18,800	19,000	17,800	17,800	16,900	16,500	16,100	15,100
	Lbs. H20/hr.	23.0	22.3	21.8	21.6	20.7	19.4	19.7	19.9	18.7	18.9	17.7	17.9	16.8	16.8	15.9	15.6	15.2	14.2
	Supply Air DB	55.5	68.7	55.9	70.5	56.3	71.5	56.7	74.4	57.2	76.4	57.7	78.5	58.2	80.6	58.8	82.8	59.3	85.1
	Supply Air WB	54.9	57.9	55.2	58.9	55.5	58.9	56.0	60.9	56.4	62.0	56.9	63.0	57.4	64.2	57.9	65.3	58.4	66.4
	Suction PSIG[4]	138	127	139	129	140	127	141	131	142	133	144	135	145	137	147	139	148	141
	Discharge PSIG[4]	291	268	311	281	333	293	355	310	379	326	403	342	429	359	455	377	483	396
75/68 (70% RH)	Total Cooling Btuh	59,000	32,900	57,000	30,000	55,100	26,500	53,200	23,500	51,300	20,000	49,400	16,400	47,600	12,500	45,900	8,500	44,200	4,400
	Sensible Btuh	31,000	6,200	30,200	4,000	29,600	2,800	28,700	(600)	27,900	(3,100)	27,100	(5,600)	26,200	(8,200)	25,400	(11,000)	24,500	(13,800)
	S/T	0.525	0.188	0.530	0.133	0.537	0.106	0.539	0	0.544	0	0.549	0	0.550	0	0.553	0	0.554	0
	Latent Btuh	28,000	26,700	26,800	26,000	25,500	23,700	24,500	24,100	23,400	23,100	22,300	22,000	21,400	20,700	20,500	19,500	19,700	18,200
	Lbs. H20/hr.	26.4	25.2	25.3	24.5	24.1	22.4	23.1	22.7	22.1	21.8	21.0	20.8	20.2	19.5	19.3	18.4	18.6	17.2
	Supply Air DB	56.8	69.8	57.1	71.6	57.5	72.6	58.0	75.5	58.4	77.5	58.9	79.6	59.4	81.7	60.0	83.9	60.6	86.2
	Supply Air WB	56.2	59.0	56.6	60.0	56.9	60.0	57.4	62.0	57.8	63.0	58.2	64.1	58.7	65.2	59.2	66.4	59.8	67.5
	Suction PSIG[4]	141	131	142	132	143	131	144	134	146	136	147	138	148	140	150	142	152	144
	Discharge PSIG[4]	293	271	314	284	335	296	358	314	381	329	405	346	431	363	457	381	485	400
80/68.3 (55% RH)	Total Cooling Btuh	59,600	34,700	57,600	31,800	55,700	28,300	53,700	25,300	51,800	21,800	50,000	18,200	48,200	14,400	46,400	10,400	44,700	6,200
	Sensible Btuh	39,500	12,300	38,700	10,100	38,100	8,900	37,200	5,500	36,400	3,000	35,500	500	34,700	(2,100)	33,800	(4,900)	33,000	(7,700)
	S/T	0.663	0.35	0.672	0.32	0.684	0.31	0.693	0.22	0.703	0.14	0.710	0.03	0.720	0	0.728	0	0.738	0
	Latent Btuh	20,100	22,400	18,900	21,700	17,600	19,400	16,500	19,800	15,400	18,800	14,500	17,700	13,500	16,500	12,600	15,300	11,700	13,900
	Lbs. H20/hr.	19.0	21.1	17.8	20.5	16.6	18.3	15.6	18.7	14.5	17.7	13.7	16.7	12.7	15.6	11.9	14.4	11.0	13.1
	Supply Air DB	57.5	70.8	57.9	72.6	58.2	73.6	58.7	76.5	59.1	78.5	59.6	80.6	60.2	82.8	60.7	85.0	61.3	87.2
	Supply Air WB	56.5	59.0	56.9	60.0	57.2	60.0	57.7	62.0	58.1	63.1	58.6	64.1	59.0	65.2	59.6	66.4	60.1	67.5
	Suction PSIG[4]	142	133	143	134	144	133	145	137	147	139	148	140	150	142	151	144	153	146
	Discharge PSIG[4]	292	271	313	285	334	297	357	314	380	330	405	346	430	363	456	381	484	400

[1] Values listed are with ventilation package disabled

[2] Return air temperature °F @ Default airflow (1550 CFM) for AC tests and Balanced Climate airflow (1060 CFM) for dehumidification tests

[3] Below 50°F, unit requires a factory or field installed low ambient control.

[4] Suction pressure +/- 4 psi, Discharge pressure +/- 10 psi

W60HCD Cooling and Dehumidification Application Data[1]

DB/WB[2]	OD Temp.	65°F[3]		70°F		75°F		80°F		85°F		90°F		95°F		100°F		105°F	
	Mode	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum
75/62.5 (50% RH)	Total Cooling Btuh	63,100	31,800	61,600	28,300	59,700	26,000	58,200	21,200	56,300	17,500	54,300	13,700	52,200	9,900	50,000	6,000	47,700	2,000
	Sensible Btuh	46,500	14,100	45,900	11,600	45,300	9,200	44,400	6,700	43,600	4,100	42,700	1,600	41,700	(1,000)	40,700	(3,700)	39,600	(6,300)
	S/T	0.737	0.443	0.745	0.410	0.759	0.354	0.763	0.316	0.774	0.234	0.786	0.117	0.799	0	0.814	0	0.830	0
	Latent Btuh	16,600	17,700	15,700	16,700	14,400	16,800	13,800	14,500	12,700	13,400	11,600	12,100	10,500	10,900	9,300	9,700	8,100	8,300
	Lbs. H20/hr.	15.7	16.7	14.8	15.8	13.6	15.8	13.0	13.7	12.0	12.6	10.9	11.4	9.9	10.3	8.8	9.2	7.6	7.8
	Supply Air DB	50.9	64.8	51.3	66.5	51.7	67.6	52.1	70.2	52.5	72.0	52.9	73.9	53.4	75.8	53.8	77.7	54.3	79.7
	Supply Air WB	49.9	54.4	50.3	55.3	50.7	55.7	51.0	57.2	51.4	58.2	51.8	59.1	52.2	60.1	52.7	61.1	53.1	62.1
	Suction PSIG[4]	124	114	125	116	127	118	127	120	129	123	130	125	131	127	132	129	134	132
	Discharge PSIG[4]	284	267	305	282	328	296	348	312	371	328	396	344	421	361	447	379	474	398
75/64.1 (55% RH)	Total Cooling Btuh	64,600	33,700	63,100	30,300	61,400	26,700	59,700	23,100	57,800	19,500	55,800	15,700	53,700	11,900	51,500	8,000	49,100	4,000
	Sensible Btuh	43,900	12,600	43,200	10,200	42,500	7,700	41,800	5,200	41,000	2,700	40,100	100	39,100	(2,500)	38,000	(5,100)	36,900	(7,800)
	S/T	0.680	0.37	0.685	0.34	0.692	0.29	0.700	0.23	0.709	0.14	0.719	0.01	0.728	0	0.738	0	0.752	0
	Latent Btuh	20,700	21,100	19,900	20,100	18,900	19,000	17,900	17,900	16,800	16,800	15,700	15,600	14,600	14,400	13,500	13,100	12,200	11,800
	Lbs. H20/hr.	19.5	19.9	18.8	19.0	17.8	17.9	16.9	16.9	15.8	15.8	14.8	14.7	13.8	13.6	12.7	12.4	11.5	11.1
	Supply Air DB	52.3	65.8	52.6	67.6	53.0	69.4	53.4	71.2	53.8	73.1	54.3	74.9	54.7	76.8	55.2	78.8	55.7	80.7
	Supply Air WB	51.4	55.4	51.7	56.4	52.1	57.3	52.5	58.3	52.9	59.2	53.3	60.2	53.7	61.2	54.1	62.2	54.6	63.1
	Suction PSIG[4]	127	118	129	120	130	122	131	124	132	126	133	128	135	130	136	133	137	135
	Discharge PSIG[4]	287	271	307	285	329	300	351	315	374	331	398	348	423	365	449	383	477	401
75/65.5 (60% RH)	Total Cooling Btuh	66,100	35,700	64,600	32,200	62,700	29,900	61,100	25,100	59,200	21,400	57,300	17,700	55,200	13,800	52,900	9,900	50,600	6,000
	Sensible Btuh	41,200	11,200	40,600	8,700	40,000	6,300	39,100	3,800	38,300	1,200	37,400	(1,300)	36,400	(3,900)	35,400	(6,600)	34,300	(9,200)
	S/T	0.623	0.314	0.628	0.270	0.638	0.211	0.640	0.151	0.647	0.056	0.653	0	0.659	0	0.669	0	0.678	0
	Latent Btuh	24,900	24,500	24,000	23,500	22,700	23,600	22,000	21,300	20,900	20,200	19,900	19,000	18,800	17,700	17,500	16,500	16,300	15,200
	Lbs. H20/hr.	23.5	23.1	22.6	22.2	21.4	22.3	20.8	20.1	19.7	19.1	18.8	17.9	17.7	16.7	16.5	15.6	15.4	14.3
	Supply Air DB	53.6	66.9	54.0	68.6	54.4	69.7	54.8	72.3	55.2	74.1	55.6	76.0	56.1	77.9	56.5	79.8	57.0	81.8
	Supply Air WB	52.9	56.5	53.2	57.5	53.6	57.9	53.9	59.4	54.3	60.3	54.7	61.3	55.1	62.3	55.6	63.2	56.0	64.2
	Suction PSIG4	131	121	132	123	134	125	134	127	136	129	137	132	138	134	139	136	140	138
	Discharge PSIG4	290	274	310	289	333	303	353	319	376	335	401	351	426	368	452	386	479	405
75/66.7 (65% RH)	Total Cooling Btuh	67,600	37,700	66,000	34,200	64,100	31,900	62,600	27,000	60,700	23,400	58,700	19,600	56,600	15,800	54,400	11,900	52,100	7,900
	Sensible Btuh	38,600	9,700	37,900	7,300	37,400	4,800	36,500	2,300	35,700	(200)	34,800	(2,800)	33,800	(5,400)	32,800	(8,000)	31,600	(10,700)
	S/T	0.571	0.26	0.574	0.21	0.583	0.15	0.583	0.09	0.588	0	0.593	0	0.597	0	0.603	0	0.607	0
	Latent Btuh	29,000	28,000	28,100	26,900	26,700	27,100	26,100	24,700	25,000	23,600	23,900	22,400	22,800	21,200	21,600	19,900	20,500	18,600
	Lbs. H20/hr.	27.4	26.4	26.5	25.4	25.2	25.6	24.6	23.3	23.6	22.3	22.5	21.1	21.5	20.0	20.4	18.8	19.3	17.5
	Supply Air DB	55.0	67.9	55.3	69.7	55.7	70.8	56.1	73.3	56.5	75.2	57.0	77.0	57.4	78.9	57.9	80.9	58.4	82.8
	Supply Air WB	54.3	57.6	54.7	58.5	55.0	58.9	55.4	60.4	55.8	61.4	56.2	62.4	56.6	63.3	57.0	64.3	57.5	65.3
	Suction PSIG[4]	134	124	135	126	138	128	138	131	139	133	140	135	141	137	143	139	144	142
	Discharge PSIG[4]	292	278	312	292	335	306	356	322	379	338	403	355	428	372	455	390	482	408
75/68 (70% RH)	Total Cooling Btuh	69,000	39,600	67,500	36,100	65,600	33,800	64,100	29,000	62,200	25,300	60,200	21,600	58,100	17,700	55,900	13,800	53,600	9,900
	Sensible Btuh	35,900	8,300	35,300	5,800	34,700	3,400	33,800	900	33,000	(1,700)	32,100	(4,200)	31,100	(6,800)	30,100	(9,400)	29,000	(12,100)
	S/T	0.520	0.210	0.523	0.161	0.529	0.101	0.527	0.031	0.531	0	0.533	0	0.535	0	0.538	0	0.541	0
	Latent Btuh	33,100	31,300	32,200	30,300	30,900	30,400	30,300	28,100	29,200	27,000	28,100	25,800	27,000	24,500	25,800	23,200	24,600	22,000
	Lbs. H20/hr.	31.2	29.5	30.4	28.6	29.2	28.7	28.6	26.5	27.5	25.5	26.5	24.3	25.5	23.1	24.3	21.9	23.2	20.8
	Supply Air DB	56.3	69.0	56.7	70.7	57.1	71.8	57.5	74.4	57.9	76.2	58.3	78.1	58.8	80.0	59.3	81.9	59.7	83.9
	Supply Air WB	55.8	58.7	56.1	59.6	56.5	60.0	56.8	61.5	57.2	62.5	57.6	63.4	58.1	64.4	58.5	65.4	58.9	66.4
	Suction PSIG[4]	138	128	139	130	141	131	141	134	142	136	144	138	145	140	146	143	147	145
	Discharge PSIG[4]	295	281	315	296	338	310	358	326	382	342	406	358	431	375	457	393	484	412
80/68.3 (55% RH)	Total Cooling Btuh	69,600	41,700	68,100	38,200	66,200	35,900	64,700	31,100	62,800	27,400	60,800	23,700	58,700	19,800	56,500	15,900	54,200	12,000
	Sensible Btuh	45,900	14,800	45,300	12,400	44,700	9,900	43,800	7,400	43,000	4,900	42,100	2,300	41,100	(300)	40,100	(2,900)	39,000	(5,600)
	S/T	0.659	0.35	0.665	0.32	0.675	0.28	0.677	0.24	0.685	0.18	0.692	0.10	0.700	0	0.710	0	0.720	0
	Latent Btuh	23,700	26,900	22,800	25,800	21,500	26,000	20,900	23,700	19,800	22,500	18,700	21,400	17,600	20,100	16,400	18,800	15,200	17,600
	Lbs. H20/hr.	22.4	25.4	21.5	24.3	20.3	24.5	19.7	22.4	18.7	21.2	17.6	20.2	16.6	19.0	15.5	17.7	14.3	16.6
	Supply Air DB	57.1	69.9	57.5	71.7	57.9	72.8	58.3	75.3	58.7	77.2	59.1	79.1	59.6	81.0	60.0	82.9	60.5	84.8
	Supply Air WB	56.1	58.7	56.5	59.6	56.8	60.0	57.2	61.5	57.6	62.5	58.0	63.4	58.4	64.4	58.8	65.4	59.3	66.4
	Suction PSIG[4]	139	130	140	132	142	134	142	136	144	139	145	141	146	143	147	145	148	148
	Discharge PSIG[4]	294	282	314	296	337	310	357	326	381	342	405	359	430	376	456	394	483	412

[1] Values listed are with ventilation package disabled

[2] Return air temperature °F @ Default airflow (1750 CFM) for AC tests and Balanced Climate airflow (1250 CFM) for dehumidification tests

[3] Below 50°F, unit requires a factory or field installed low ambient control.

[4] Suction pressure +/- 4 psi, Discharge pressure +/- 10 psi

TABLE 2
Dehumidification Relay Logic Board

Energize on Unit Terminal Strip	Mode	Occupied/ Unoccupied	Inputs to the Board							Outputs from the Board						
			RAT	Y	B	W2	A1	D	G	G1	BK	RV	TWV	W	YO	A2
Y1, G	1st Cooling	Unoccupied		X							X				X	
Y1, G, A	1st Cooling	Occupied		X			X				X				X	X
Y1, G, A, D	1st Cooling w/Dehum ①	Occupied		X			X	X			X				X	X
Y1, G, D	1st Cooling w/Dehum ①	Unoccupied		X				X			X				X	
Y1, G, B/W1	1st Heat Pump	Unoccupied		X	X						X	X			X	
Y1, G, B/W1, A	1st Heat Pump	Occupied		X	X		X				X	X			X	X
Y1, G, B/W1, A, D	1st Heat Pump w/Dehum ①	Occupied		X	X		X	X			X		X	X	X	X
Y1, G, B/W1, D	1st Heat Pump w/Dehum ①	Unoccupied		X	X			X			X	X			X	
Y1, G, B/W1, W2	2nd Heat Pump w/Strips	Unoccupied		X	X	X					X	X		X	X	
Y1, G, B/W1, W2, A	2nd Heat Pump w/Strips	Occupied		X	X	X	X				X	X		X	X	X
Y1, G, B/W1, W2, A, D	2nd Heat Pump w/Strips and Dehum ①	Occupied		X	X	X	X	X			X	X		X	X	X
Y1, G, B/W1, W2, D	2nd Heat Pump w/Strips and Dehum ①	Unoccupied		X	X	X		X			X	X		X	X	
D	Dehum	Unoccupied						X					X ②		X ②	
D, A	Dehum	Occupied					X	X					X		X	X

① Cooling takes precedence over dehumidification. A cooling call cancels dehumidification.

② The relay logic board has a jumper (J1) on it to choose between “any-time dehumidification” and “occupied dehumidification”. The factory default is P1-P2. With the jumper in the P1-P2 position, dehumidification is available any time there is a “D” input to the relay logic board. With the jumper in the P2-P3 position, dehumidification is available when there is an occupancy signal to the “A1” terminal, “D” would also need to be energized to dehumidify.

Refer to sequence of operation. In most cases cooling and heating modes take priority over dehumidification.

TABLE 3
Electrical Specifications – Dehumidification Models

MODEL	Rated Volts & Phase	No. Field Power Circuits	Single Circuit				Dual Circuit							
			① Minimum Circuit Ampacity	② Maximum External Fuse or Ckt. Brkr.	③ Field Power Wire Size	③ Ground Wire	① Minimum Circuit Ampacity		② Maximum External Fuse or Ckt. Breaker		③ Field Power Wire Size		③ Ground Wire Size	
							Ckt. A	Ckt. B	Ckt. A	Ckt. B	Ckt. A	Ckt. B	Ckt. A	Ckt. B
W24HBDA00, A0Z	230/208-1	1	19	25	10	10								
A04		1	40	45	8	10								
A08		1 or 2	61	70	6	8	19	42	25	45	8	10	10	10
W24HBDB00, B0Z	230/208-3	1	15	20	12	12								
B05		1	30	30	8	10								
W24HBDC00, C0Z	460-3	1	8	10	14	14								
C05		1	15	15	12	12								
W30HBDA00, A0Z	230/208-1	1	24	35	8	10								
A05		1	50	50	8	10								
A10		1 or 2	76	80	4	8	50	26	60	30	8	10	10	10
W30HBDB00, B0Z	230/208-3	1	18	25	10	10								
B05		1	33	45	8	10								
B09		1	45	50	8	10								
W30HBDC00, C0Z	460-3	1	9	10	14	14								
C05		1	16	20	12	12								
C09		1	22	25	10	10								
W36HBDA00, A0Z	230/208-1	1	28	40	8	10								
A05		1	54	60	6	10								
A10		1 or 2	80	90	4	8	54	26	60	30	6	10	10	10
W36HBDB00, B0Z	230/208-3	1	20	25	10	10								
B05		1	35	40	8	10								
B09		1	47	50	8	10								
W36HBDC00, C0Z	460-3	1	11	15	14	14								
C05		1	19	20	12	12								
C09		1	24	25	10	10								
W42HCDA00, A0Z	230/208-1	1	34	45	8	10								
A05		1	60	60	6	10								
A10		1 or 2	88	90	3	8	60	26	60	30	6	10	10	10
W42HCDB00, B0Z	230/208-3	1	26	35	8	10								
B05		1	41	45	8	10								
B09		1	53	60	6	10								
W42HCDC00, C0Z	460-3	1	12	15	14	14								
C05		1	20	20	10	10								
C09		1	26	30	10	10								
W48HCDA00, A0Z	230/208-1	1	35	50	8	10								
A05		1 or 2	61	70	6	8	35	26	40	30	8	10	10	10
A10		1 or 2	87	90	3	8	35	52	40	60	8	6	10	10
W48HCDB00, B0Z	230/208-3	1	25	35	8	10								
B05		1	40	50	8	10								
B09		1	52	60	6	10								
W48HCDC00, C0Z	460-3	1	12	15	14	14								
C05		1	20	20	10	10								
C09		1	26	30	10	10								
W60HCDA00, A0Z	230/208-1	1	41	60	8	10								
A05		1 or 2	67	80	4	8	41	26	50	30	8	10	10	10
A10		1 or 2	99	100	3	6	41	52	50	60	8	6	10	10
W60HCDB00, B0Z	230/208-3	1	28	40	8	10								
B09		1	55	60	6	10								
W60HCDC00, C0Z	460-3	1	14	25	10	10								
C09		1	28	30	10	10								

① These "Minimum Circuit Ampacity" values are to be used for sizing the field power conductors. Refer to the National Electrical code (latest version), Article 310 for power conductor sizing.

CAUTION: When more than one field power circuit is run through one conduit, the conductors must be derated. Pay special attention to note 8 of Table 310 regarding Ampacity Adjustment Factors when more than three (3) current carrying conductors are in a raceway.

② Maximum size of the time delay fuse or circuit breaker for protection of field wiring conductors.

③ Based on 75°copper wire. All wiring must conform to the National Electrical Code and all local codes.

IMPORTANT: While this electrical data is presented as a guide, it is important to electrically connect properly sized fuses and conductor wires in accordance with the National Electrical Code and all local codes.

F.W. Webb Company
80 Park Avenue
Williston, VT 05495
TEL# (802-879-5155)
FAX# (802-879-4848)

Quote
Date Number
10/27/20 69156946

To:
NORTHERN RELIABILITY
81 DEMERRITT PLACE

WATERBURY VT 05676

(802-496-2955) Fax# (802-329-2096)

NORTHERN RELIABILITY
81 DEMERRITT PLACE

WATERBURY VT 05676

Cust #	Customer Po#	Rel#	Writer	Date Req
149875	TENNASEE BARD		KLL	10/27/20

Quoted By: KEVIN LUSIGNAN

Quantity	Description	Net Price	Exten	Ln#
32	#5 TON 460V HEAT PUMP + BADW60HCDC0ZBXXXXJ (S3988980)	6179.330	197738.56	(1)
32	#SUPPLY GRILLE + BADSG5W (S2256061)	64.140	2052.48	(2)
32	RETURN GRILL 30X16 BADRG5W (436078)	60.580	1938.56	(3)
8	#CONTROLLER WITH ALARM BOAR + BADMC5600-BC (S3987965)	1332.640	10661.12	(4)
1	SHIPPING & HANDLING MISFRT (88123) FRT IS AN ESTIMATE	900.000	900.00	(5)

BREAK-ST: 213290.72

Sub Total: 213290.72
Tax: 0.00
Total: 213290.72

*** NUMBER OF DAYS QUOTE VALID IS 15 ***
PLEASE REFERENCE QUOTE # 69156946 FOR INQUIRIES OR ORDER OF ABOVE MATERIAL

+ THIS PRODUCT IS A SPECIAL ITEM. RESTOCKING FEES MAY APPLY.

NRI000586

Submittal Data

Northern Reliability Tennessee

Date: October 26, 2020

NRI000587

Project: Northern Reliability Tennessee

Plan-ID	Qty	Model No	Description	Page
Control	8	MC5600-BC	Telecom Controller	3
WM-01	32	W60HCDC0ZBXXXXE	Wall-Mount™ Heat Pump 460-3 ph	7

NRI000588

Project: Northern Reliability Tennessee Plan-ID: Control Page: 3
Model Number: MC5600-BC Quantity: 8

MC5600-BC Controller with local alarms, NO/NC alarm contacts, ethernet Webpages and Modbus

The MC5600 has 2 stages of cooling control available for up to 6 connected air conditioners. It is designed for systems with or without economizers or dehumidification or for systems with 2-stage or dual compressors. The 2nd stage available for each air conditioner permits complete and proper control when economizers are installed or when 2-stage or dual compressors are utilized. An onboard humidity sensor allows the controller to provide electric reheat dehumidification or control a humidfier. It can also be configured for use with heat pumps.

Factory Options Selected

Field Installed Accessories

8408-061 - Temp/Humidity Sensor - The on board temperature and humidity sensor may be replaced with a remote mounted sensor. Cable length is 35 ft.

Project: Northern Reliability Tennessee Plan-ID: Control Page: 4
Model Number: MC5600-BC Quantity: 8

Standard Product Features

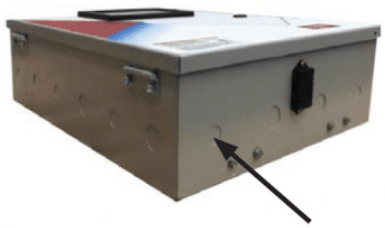
Controller:
• Programmable
• Works with or without economizers
• Dehumidification control option
• Ethernet connectivity, local monitoring, and diagnostics through the use of the color touchscreen
• Contains the alarm board that provides NO/NC contacts. This can be used to connect to a building Network Operations Center (NOC) system using Normally Open and Normally Closed dry contacts.
• Settings and alarms are available using the color touchscreen on the front of the controller. Remote monitoring can be accomplished through the ethernet connection provided using built-in webpages and a web browser, or by using Modbus and polling information from a points list. Two alarm boards for Normally Open/ Normally closed contacts for 1 to 6 units are provided.
• Remote monitoring can be accomplished through the ethernet connection provided using built-in webpages and a web browser, or by using Modbus and polling information from a points list.
• NO/NC Output Contacts for each unit: Hi/Lo Pressure Unit Lockout, Power Loss.
• NO/NC Output Contacts for all units: Theft, Dirty Filter, 2nd cooling stage.
• NO/NC Output Contacts for Controller: Controller fail, Generator, Utility Power Loss, Hi Temp 1, Hi Temp 2, Hydrogen*, Smoke/Fire*.
Ease of Installation
• Powered by 24V from A/C units
• Durable metal enclosure adequately sized for ease of conduit and wire installation
• Can be used with heat pumps
Certifications & Approvals
• Intertek ETL Listed to ANSI/UL916
Controller Enclosure
• 20-Gauge Gray Pre-Painted Metal
• 16.34" W x 20.50" H x 6.22" D
• Hinged Cover
• Twenty (20) Diameter Knockouts

Project: Northern Reliability Tennessee Plan-ID: Control Page: 5
Model Number: MC5600-BC Quantity: 8

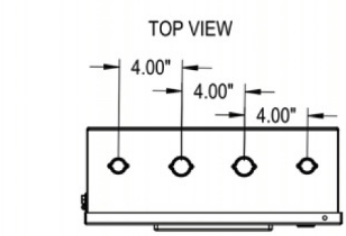
The exterior of the MC controller is an industrial grade NEMA 1 enclosure. An ANSI 61 gray polyester paint design eliminates sharp edges on the door and inside the controller. 16 GA. steel construction with various knockout sizes. Cleanable vinyl graphics are present on the hinged front cover.

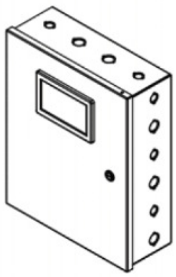
Color Touchscreen
The controller includes a large 3.25" x 6" touchscreen with backlit display. An intuitive menu system provides settings and alarms.

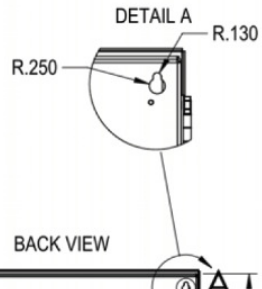
Quarter Turn Fastener:
Access to the inner control area is provided through a hinged door held closed with a quarter turn fastener.

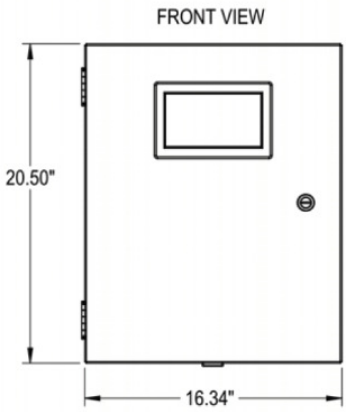


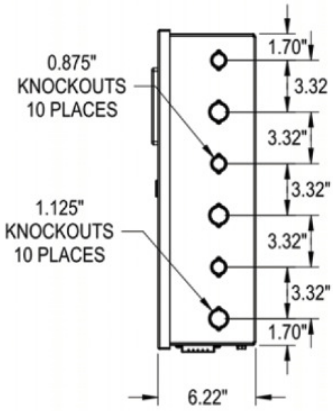
Multiple Knockouts:
Knockouts are provided for wire routing to units and for external communication and alarm wiring.

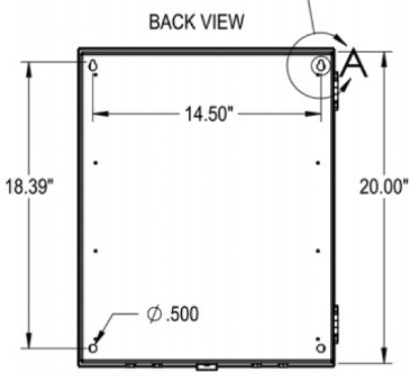


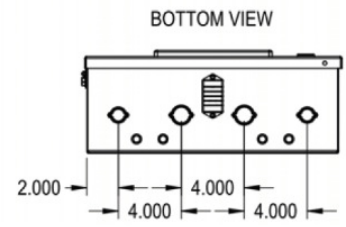












CONTROLLER ENCLOSURE SPECIFICATIONS:

- 16-GAUGE POST-PAINTED GALVANIZED
- 20.50" H X 16.34" W X 6.22" D
- KNOCKOUTS
  - 10 TOTAL 7/8" KNOCKOUTS
  - 10 TOTAL 1-1/8" KNOCKOUTS

NOTES:
GROUND LUGS ARE LOCATED ON THE INSIDE OF THE ENCLOSURE

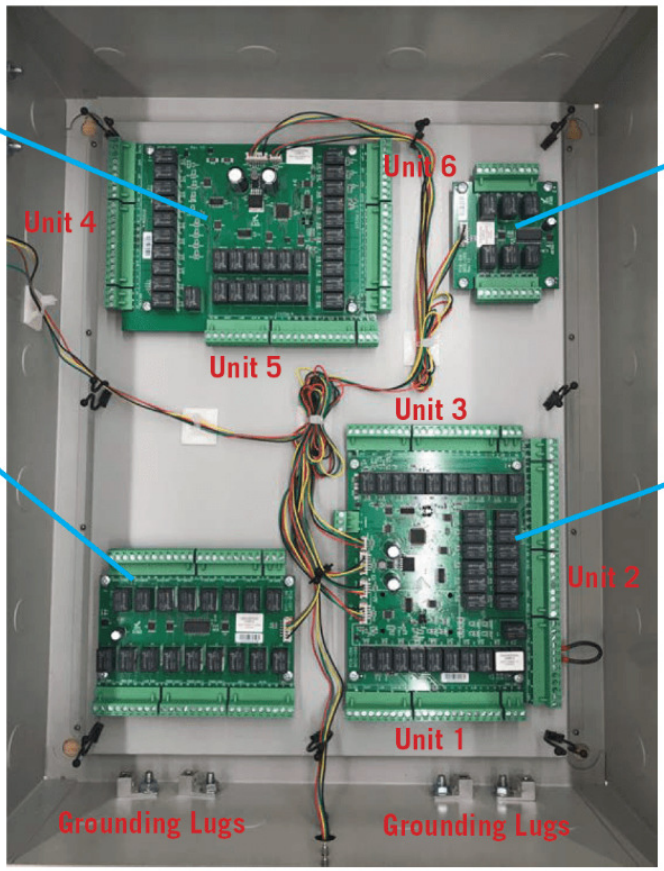
NRI000591

Project: Northern Reliability Tennessee Plan-ID: Control Page: 6
Model Number: MC5600-BC Quantity: 8

The interior of the MC controller provides many features for use, installation and setup. Field wire connection screw terminals are identified and correspond to documentation inside the controller. Power is supplied to the controller by the wall mount units. Ethernet CAT 6 connection is provided for user remote interaction with the MC controller using built-in webpages or Modbus.

Secondary Control Board (MC5600 Only): Connection points are provided for 4 to 6 Wall mount air conditioners or heat pumps. Units can include optional mechanical dehumidifaction and economizer ventilation.

Primary Alarm Board: The alarm board allows for Normally Open or Normally Closed dry contacts to be used for remote monitoring of equipment and the controller. Used only in MC5300-BC and MC5600-BC models.



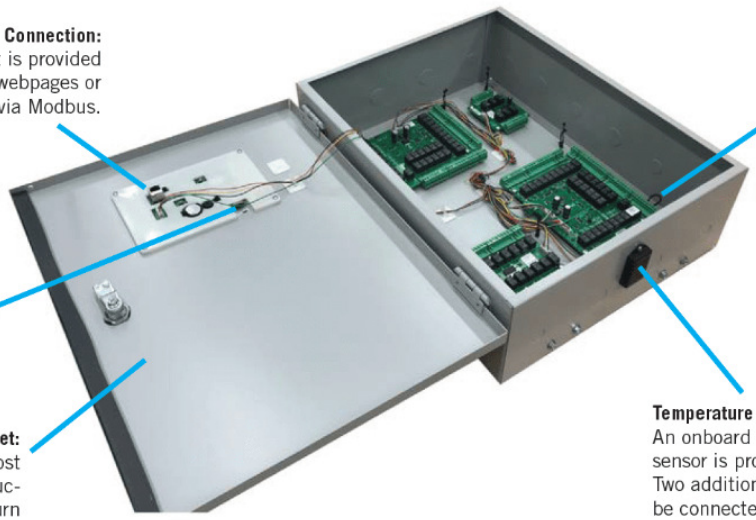
Secondary Alarm Board (MC5600 Only): The alarm board allows for Normally Open or Normally Closed dry contacts to be used for remote monitoring of equipment and the controller. Used only in MC5600-BC models.

Main Control Board (MC5300 and MC5600): Connection points are provided for 1 to 3 Wall mount air conditioners or heat pumps. Units can include optional mechanical dehumidifaction and economizer ventilation. Inputs are also provided for theft, emergency vent, generator , and (2) remote temperature sensors.

Ethernet Cable Connection: An ethernet CAT 6 port is provided to connect to built-in webpages or communicate via Modbus.

SD Card Slot: An SD card slot is provided for data storage, software updates, and backup.

Post Painted 16ga. Steel Cabinet: The controller enclosure is post painted 16ga. steel construction. Front door uses a 1/4 turn fastener latch.



Emergency Off Jumper: Remove jumper and connect to device for emergency equipment shutdown feature.

Temperature and Humidity Sensor: An onboard temperature and humidity sensor is provided with the controller. Two additional temperature sensors can be connected for remote temperature monitoring.

NRI000592

Project: Northern Reliability Tennessee Plan-ID: WM-01 Page: 7
Model Number: W60HCDC0ZBXXXXE Quantity: 32

AHRI Rated Cooling Performance

AHRI Certified Reference #	20434541 1	
AHRI Rated Cooling Capacity	54,000	Btuh
EER	11.00	
Rated Airflow	1750	cfm

Cooling Performance @ Project Parameters

Cooling Capacity	54,811	Btuh
Sensible Capacity	41,991	Btuh
Latent Capacity	12,820	Btuh
Efficiency (at AHRI)	11.00	EER
Outdoor DB Temp	95.0	°F
Entering DB Temp	80.0	°F
Entering WB Temp	67.0	°F
Leaving DB Temp	58.4	°F
Leaving WB Temp	57.5	°F

HP Heating Performance

HP Capacity @47.0°F	50,712	Btuh
HP Capacity @17.0°F	33,349	Btuh
HP COP @47.0°F	3.3	
HP COP @17.0°F	2.3	
HP Heating Outside Temp	10.0	°F
HP Heating Entering Air	70.0	°F
HP Heating Capacity	30,117	Btuh
HP Heating Leaving Temp	85.5	°F

Dehumidification Performance

75° Outdoor 70% Indoor RH (75° / 68° db/wb)		
Air Flow	1750	cfm
Sensible Capacity	3,400	Btuh
Latent Capacity	30,400	Btuh
Water Removed per hour	28.70	lb

Supply Air Performance

Total Supply Air	1800	cfm
Blower Motor	3/4	hp
Low Blower Speed Non-Ducted		

Air flow is based on Wet Coil

Electrical Data

Power Supply	460	Volts
	3	Phase
	60	Hertz
Minimum Circuit Ampacity	14	Amps
Maximum External Fuse or Circuit Breaker	25	Amps
Field Power Wire Size	10	
Ground Wire	10	

Based on 75C copper wire, All wiring must conform to the National Electrical Code and all local codes

Caution: When more than one field power circuit is run through one conduit, the conductors must be derated. Pay special attention to note 8 of Table 310 regarding Ampacity Adjustment Factors when more than three (3) current carrying conductors are in a raceway.

Approximate Installed Weight

Unit Weight	515	lb
Option Weight	7	lb
Accessory Weight	13	lb
Total Weight	535	lb

Factory Options Selected

D - Active Dehumidification
C - 460 Volt 3 phase
0Z - No Heat with Circuit Breaker Disconnect
B - Blank-Off Plate
X - 1-inch Fiberglass MERV 2
X - Beige
X - Std. Hydrophilic Fin Evap. & Uncoated Alum. Cond. Coil
E - Hi Pressure Switch, Low Pressure Switch, Compressor Control Module, Low Ambient Control

Field Installed Accessories

RG-5W - Return air grill - Extruded aluminum with blades fixed at 30 degree angle, 2" Flange
SG-5W - Sidewall supply register with 2 sets of individually adjusted blades, 2" Flange

NRI000593

Project: Northern Reliability Tennessee Plan-ID: WM-01 Page: 8
Model Number: W60HCDC0ZBXXXXE Quantity: 32

Standard Product Features

• Non-Fiberglass Foil Faced Insulation: Environmentally friendly high "R" value non-fiberglass insulation that is made with recycled denim and cotton materials used with a FSK foil face that is both durable and cleanable
• Durable Cabinet Construction: Multiple cabinet construction options are available for different outdoor conditions. Optional cabinet coatings may be ordered for extreme outdoor environments.
• Green Fin Hydrophilic Evaporator Coil: Green fin stock is used to help prevent mold growth, aid with condensate drainage, and provide a limited amount of protection to corrosive particulates in the airstream.
• Mechanical Dehumidification: Hot gas reheat dehumidification for energy efficient humidity removal. Electronic Expansion Valves are standard for all dehumidification models.
• Balanced Climate™ Technology (patent pending): High latent capacity humidity & sound reduction removes up to 35% more humidity than any other wall mount on the market with the use of a 2 stage thermostat or controlling device. Bard Balanced Climate innovation comes standard on all models.
• Reliable, Easy-to-Use Controls: Easily accessible through front control panel locations. A lockable hinged access cover to circuit protection is provided. Phase rotation monitor is standard on all 3 phase models. Adjustable compressor on/off delay timer (CCM) with diagnostic lights is standard on all models.
• ECM Indoor Brushless DC Motor Technology: 5 speed dual shaft motor provides quiet airflow operation when used with a twin blower assembly. Motor overload protection standard on all models.
• Electric Strip Heat: Reliable, comfortable heater packages feature an automatic limit and thermal cut-off safety control.
• Easy Filter Access: A separate filter door is provided for ease of filter access during routine unit maintenance.
• Enclosed Condenser Motor: An enclosed casing condenser motor with ball bearings is used for reliable operation and extended motor life. Enclosed condenser motors are standard on all units.
• Improved Condenser Coil Cleaning: Removable fan shroud side panels allow for easy condenser coil intake surface cleaning.
• High Efficiency Cooling: Scroll compressors for quiet, efficient cooling. Designed with R-410A (HFC) non-ozone depleting refrigerant in compliance with the Montreal protocol and 2010 EPA requirements. A liquid line filter-drier to protect the system from moisture is standard on all units.
• Cooling Operation: The Bard WH Series WALL MOUNT products offer single stage cooling operation using R410A refrigerant. Copper tube/Aluminum fin coils are used to provide high efficiency and easy serviceability. Scroll compressor technology delivers years of quiet, reliable operation.
• Heating Operation: The Bard WH Series WALL MOUNT products offer single stage heat pump operation and optional single or two stage heating operation using resistance heaters. Circuit breaker disconnect protection is standard in all units equipped with electric heat.
• Mechanical Dehumidification Operation: The Bard WALL MOUNT products offer optional dehumidification that removes moisture from air entering the unit. A three-way valve, reheat coil, and electronic expansion valve (EEV) are standard with all models. The dehumidification circuit incorporates an independent heat exchanger coil in the supply air stream. This coil reheats the supply air after it passes over the cooling coil without requiring the electric resistance heater to be used for reheat purposes. This results in very high mechanical dehumidification capability from the air conditioner on demand without using electric resistance reheat.
• Ventilation Operation: The Bard WALL MOUNT products offer optional ventilation operation that brings outdoor air into the structure. Vent options can be factory or field installed, and can be used to bring in outdoor air for occupants, save energy by using outdoor air for free cooling, or positively pressurize a structure. Exhaust air options allow room air to be vented outdoors when fresh air is being brought into the structure. Energy recovery options are also available for occupied structures which condition the air being brought in to save energy when ventilation is necessary regardless of outdoor temperature.

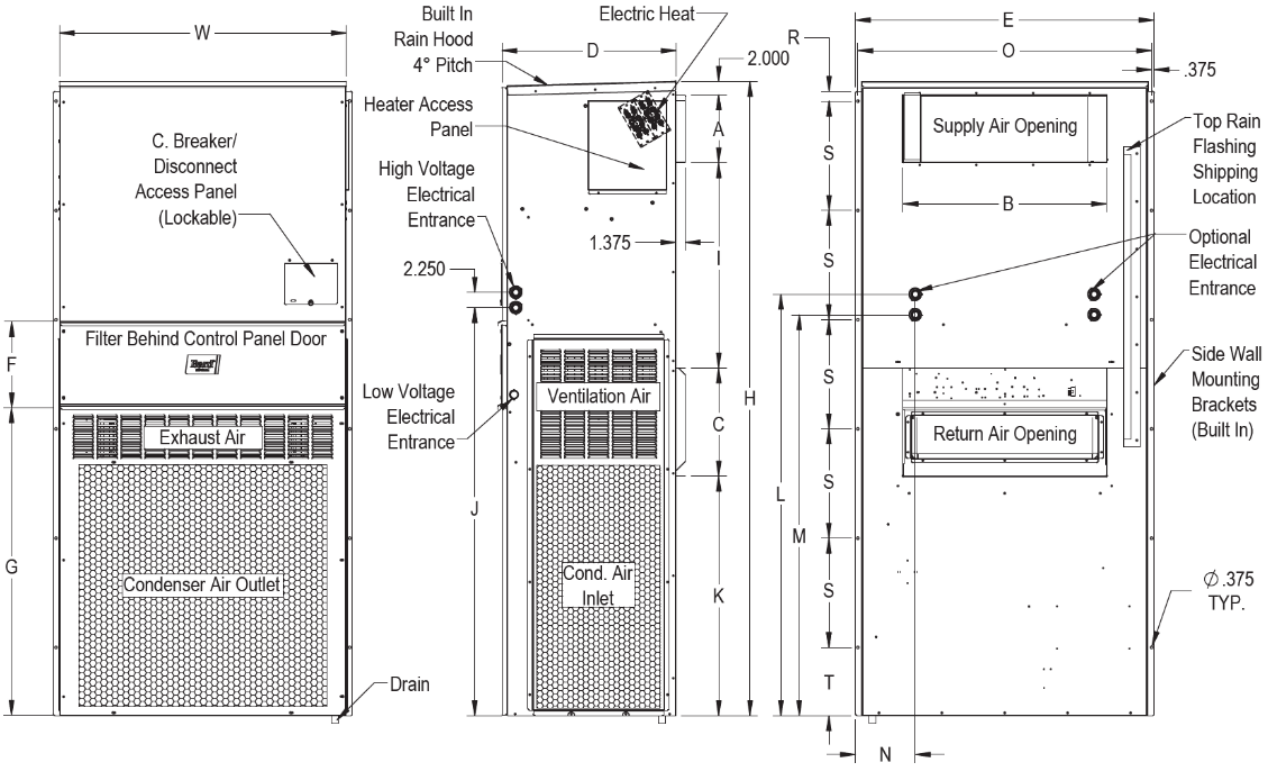
• Complies with efficiency requirements of ANSI/ASHRAE/IESNA 90.1-2016.
• Certified to ANSI/AHRI Standard 390-2003 for SPVU (Single Package Vertical Units)
• Intertek ETL Listed to Standard for Safety Heating and Cooling Equipment ANSI/UL 1995/CSA 22.2 No. 236-05, Fourth Edition.

NRI000594

Project: Northern Reliability Tennessee Plan-ID: WM-01 Page: 9
Model Number: W60HCDC0ZBXXXXE Quantity: 32

Dimensions of Basic Unit for Architectural and Installation Requirements (Inches)

Width (W)	Depth (D)	Height (H)	Supply		Return		E	F	G
			A	B	C	B			
42	25.52	93	9.88	29.88	15.88	25.52	43.88	12.63	45
I	J	K	L	M	N	O	R	S	T
30.06	59.75	35.06	61.72	58.72	8.82	43	1.438	16	10



NRI000595

Bard SINCE 1914

Bard® SINCE 1914
Climate Control Solutions

Limited Warranty

For units applied within the United States, Puerto Rico, US Virgin Islands, Guam, Canada and Mexico

Limited Warranty To Original Purchaser:
Bard Manufacturing Company, Inc. Bryan, Ohio 43506 warrants to you, the original purchaser, that your Bard product will be free from defects in materials and workmanship when used under normal conditions from the installation date through the time periods outlined in the "Duration of Warranty" section (see reverse side).

Proof Of Purchase:
You must be able to show us the date on which you purchased your product when you make a claim under this warranty. Your owner's registration card filed online at www.wallmountwarranty.com or your contractor's invoice, bill of sale, or similar document is sufficient at time of warranty claim. If you can not show us the actual date of purchase, the time periods in this warranty will start on the date that we shipped your Bard product from our factory.

What This Warranty Does Not Cover: (Also see Duration of Warranty on reverse side.)
This warranty does not cover defects or damage caused by:

1. Alterations not approved by us; improper installation (including over or under sizing), improper repairs, or servicing; or improper parts and accessories not supplied by us.
2. Misuse or failure to follow installation and operating instructions (including failure to perform preventative maintenance) or limitations on the rating plate. This includes failure to use low ambient controls on all applications requiring compressor operation in cooling mode below 60F outdoor ambient.
3. Any corrosion from operation in a corrosive atmosphere (examples: acids, halogenated hydrocarbons or environmental conditions).
4. Parts that must be replaced periodically (such as filters, oil nozzles, mist eliminators, ERV belts, pile seals, etc.).
5. Improper fuel or electrical supply (such as low voltage, voltage transients, power interruption, and units on generators with no brownout protection).
6. Accidents or other events beyond our reasonable control (such as storm, fire, or transportation damage).
7. Defects that happen after
   (a) Anyone has tampered with the product.
   (b) The product has been improperly serviced according to accepted trade practices;
   (c) The product has been moved from its original place of installation; or,
   (d) The product has been damaged by an event beyond Bard's control (See also No. 5 above).
8. Consequential damages (such as increased living expenses while the product is being repaired). Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.
9. This warranty has certain limitations for units installed on over-the-road trucks, vans and trailers. (See reverse side.)
10. Cost of service call at installation site to diagnose causes of trouble, labor to replace defective component or transportation costs for replacement parts.
11. This Limited Warranty does not apply to products installed or operated outside of the US, Puerto Rico, US Virgin Islands, Guam, Canda and Mexico. Units operated in coastal areas where the operating environment is exposed to airborne saline particles (typically 5 miles from coast line) must have corrosion protection or warrenty claims will be declined on corrosion-based cabinet and part failures.
12. Bard does not endorse, approve or certify any online sales of its products through auction websites, online retailers, liquidators or any other method of online sales direct to consumers. Bard will not honor the factory warranty of any Bard equipment purchased over the Internet.

Your Responsibilities:
You are responsible for -

1. Preventative maintenance of the product (such as cleaning and replacement of filters, nozzles and other consumable parts).
2. Insuring that the instruction manual is followed for care and use of your product.
3. Insuring that your product is installed by a competent, qualified contractor, following all local and national codes, and industry standards.

What We Will Do About A Defect:
We will either repair or replace the defective part only. Replacement parts may be reconditioned parts. The warranty for the repaired or replaced part will last only for the remainder of the warranty period for the original part. For Heat Exchangers that are no longer available, we will give you credit equal to the then current retail price of an equivalent Heat Exchanger.

Defective parts and a properly completed Bard parts warranty form must be returned to a Bard distributor for submitting to Bard to be eligible for a warranty credit or replacement. Credits are issued to the Bard distributor.

We will not pay or be responsible for labor or defective/replacement part transportation costs or delays in repairing or failures to complete repairs caused by events beyond our reasonable control.

What You Must Do

1. Tell your heating and air conditioning contractor as soon as you discover a problem and have the contractor make repairs.
2. Pay for all transportation, related service labor, diagnostic charges, refrigerant, refrigerant recovery and related items.

Service
If your product requires service, you should contact the contractor who installed it or the contractor that has been providing the product's preventative maintenance and repair service. You may find the installing contractor's name on the product or in your Owner's packet. If you do not know who that is, you should contact a competent, qualified contractor to make the repairs. If in doubt, you should contact the nearest distributor that handles Bard products (www.bardhvac.com). Please note that contractors and distributors that handle Bard products are independent contractors and distributors, and therefore, are not under the direction of Bard Manufacturing Company, Inc.

Only Warranty
This is the only warranty that we make. There are no other express warranties. All implied warranties are limited in duration to the duration of the applicable written warranty made above.
Some states do not allow limitations on how long an implied warranty lasts, so the above limitation or exclusion may not apply to you.

Other Rights
This warranty gives you specific legal rights and you may have other rights which vary from state to state.

BARD MANUFACTURING CO., INC. — BRYAN, OHIO 43506
Dependable quality equipment . . . since 1914

Form No. 7960-420
Issued: 12/04/19
Supersedes: 08/22/19

NRI000596

Duration Of Warranty is limited to defects arising during the periods shown in the following table:

Model Number Series: Includes all Models in each Series & which may have additional characters. (Example: W12-70A includes W36A w/additional characters.)	— Number of Years from Installation Date ① — Compressor ⑤	Sealed System Components ②⑤⑦	All Other Functional Parts ③	Heat Exchangers
AIR CONDITIONERS W12A, W17A, W18A, W24A, W30A, W36A, W42A, W48A, W60A, W70A, W72A, W090A, W120A, W150, W180A, W17L, W18L, W24L, W30L, W36L, W42L, W48L, W60L, W70L, W72L, WA3S, WA4S, WA5S, WL3S, W4LS, WL5S, D25A, D28A, D35A, D36A, D42A, D48A, D60A, D25L, D28L, D35L, D36L, D42L, D48L, D60L, Q24A, Q30A, Q36A, Q42A, Q48A, Q60A, I30A, I36A, I42A, I60A	5	5	5	N/A
AIR SOURCE HEAT PUMPS W18H, W24H, W30H, W36H, W42H, W48H, W60H, C24H, C30H, C36H, C42H, C48H, C60H, T24H, T30H, T36H, T42H, T48H, T60H, T24S, T30S, T36S, T42S, T48S, T60S, Q24H, Q30H, Q36H, Q42H, Q43H, Q48H, Q60H, I30H, I36H, I42H, I48H, I60H, I36Z, I48Z, I60Z	5	5	5	N/A
ENVIRONMENTAL CONTROL UNITS W3RV, W4RV, W5RV, W6RV, W3LV, W4LV, W5LV, W6LV	5	5	1	N/A
EQUIPMENT SHELTER UNITS W**A2P, W**AAP, WR**, D**AAP, HR**, H12A, H72A	5	5	1	N/A
GEOTHERMAL/WATER SOURCE HEAT PUMPS QW2S, QW3S, QW4S, QW5S	5	5	5	N/A
CHILLED WATER QC50 (No Compressor)	N/A	5	5	N/A
GAS/ELECTRIC WALL-MOUNT W24G, W30G, W36G, W42G, W48G, W60G, WG3S, WG4S, WG5S	5	5	5	10
OIL FURNACES	N/A	N/A	10 ⑥	LIFETIME ④
ECM "V" Blower Models FC085, FH085, FH110, FLF075, FLF110, FLR075, FLR100, FLR130	N/A	N/A	5	LIFETIME ④
PSC "D" Blower Models FC085, FH085D, FH110D, FLF085, FLF110, FLR085, FLR110, FLR140	N/A	N/A	1	10
SOF: SOF175, SOF265				
ACCESSORIES				
Factory/Field Installed Bard Ventilation and Heater Packages	N/A	N/A	5	N/A
Bard branded Thermostats/Temperature Controllers	N/A	N/A	5	N/A
LC1000, LC1500, LC2000, LC5000, LC6000, LV1000, MC4002, DC3003, TEC40, BG1000,	N/A	N/A	1	N/A
PGD, PGDX	N/A	N/A	1	N/A
Humidistats, CO_2 Controllers and all other field installed accessories not listed separately				

① For equipment that does not have an online warranty registration, the warranty period starts when the product was shipped from the factory.

② Heat transfer coils (refrigerant to air coils for air source and coaxial coils for water source units) are covered for leaks for 5 years. Physical damage to air side coils resulting in leaks or insufficient airflow, or fin deterioration due to corrosive atmosphere (such as acids, halogenated hydrocarbons or coastal environmental conditions) are not covered. Leaks in coaxial coils due to freezing of the coils are not covered. Copper coaxial coils for QW are not warranted for ground water/open loop installations.

③ Functional parts warranty is 1-year for all telecommunication, electric switch stations, pump stations and similar applications. This also applies to all OTR (over the road) applications.

④ Limited lifetime warranty on Heat Exchangers applies to original purchaser in private, owner occupied residences. Subsequent owners and commercial uses are warranted for 20 years from date of installation.

⑤ All OTR (over the road) applications that are moved from one location to another:
Factory Warranty applies up to the point of initial start-up and test at all OEM manufacturing locations or subsequent outfitting facility. Once it goes into OTR service, the warranty expires immediately for compressor and sealed system components. This OTR exemption does not apply to relocatable classrooms, construction or office trailers.

⑥ Standard warranty for non-registered Oil Furnaces is 5-year parts. Must be registered at www.wallmountwarranty.com within 90 days of installation for the 10-year parts coverage to be in effect.

⑦ Factory coated coils have a "5" year warranty in corrosive environments that are listed as approved.

Internet Resources

Recognized as a leader in the HVAC industry, Bard combines quality products and outstanding service with innovation and technological advances to deliver high-performance heating and cooling products around the world. Please visit www.bardhvac.com *for additional information regarding warranty and product information.*

BARD MANUFACTURING CO., INC. — 1914 Randolph Dr. — BRYAN, OHIO 43506
Dependable quality equipment . . . since 1914

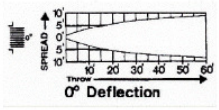
Form No. 7960-420
Issued: 12/04/19
Supersedes: 08/22/19

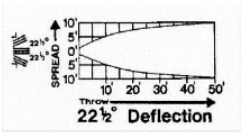
NRI000597

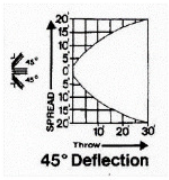
Project: Northern Reliability Tennessee
Supply Grille Spread and Throw Characteristics

Variable deflection settings to satisfy all air distribution requirements are obtained by individual adjustment of airfoil blades in the Supply Grille.

To obtain long throw and narrow air pattern use 0^0 to 22.5^0 deflection. For shorter throw and wide air patterns use up to 45^0 deflection, or more. Performance data shown in the selection charts is based on double deflection grilles with vertical airfoil blades set at 0^0, 22.5^0 and 45^0.







The sound level of a supply grille is in direct ratio to the velocity of the air passing through it.

Air passing through a properly selected outlet, will not add any appreciable noise to the sound level of the existing system.

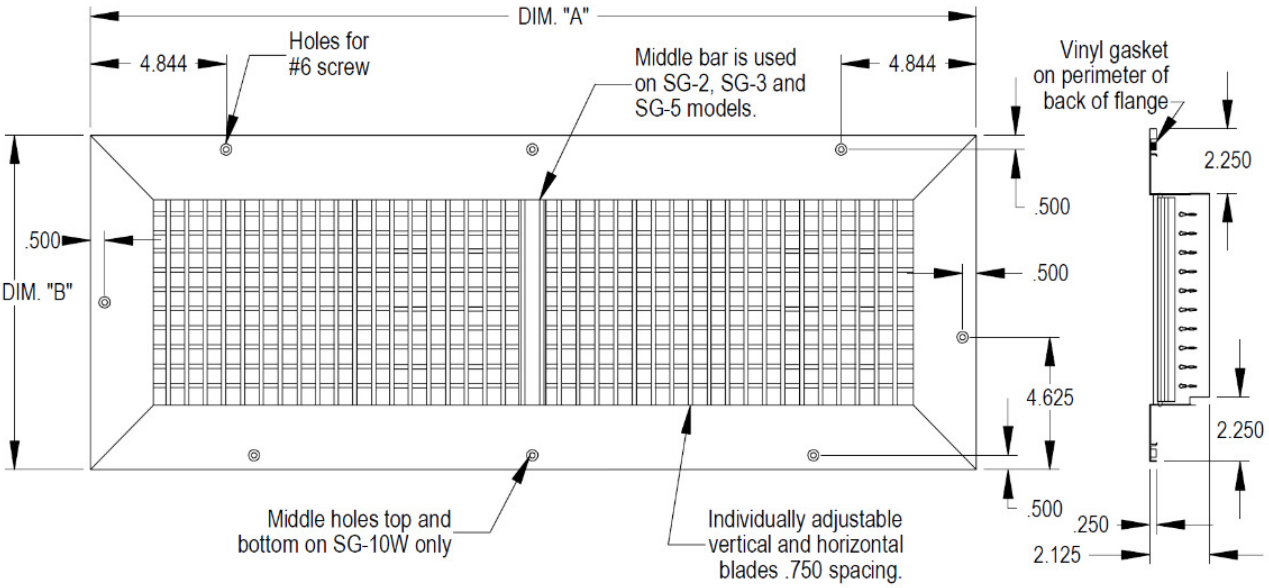
MAXIMUM NOISE CRITERIA (NC) RECOMMENDATIONS – For Supply Grilles

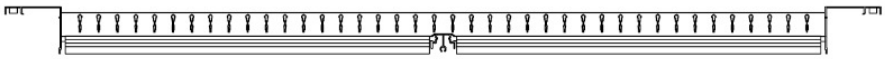
Applications	N.C. LEVEL
Broadcast Studies	Below NC-25
Residences, Apartments, Churches, Hotels, Bedrooms, Movie Theaters	NC-25-30
Private Offices	NC-35-40
Department Stores	NC-40-45
Factories, Computer Rooms, Etc.	NC-45-50

SIZE		17 X 5			20 X 8			28 X 8			30 X 10		
PART NO.		SG-1W			SG-2W			SG-3W			SG-5W		
DEFLECTION		0^0	22.5^0	45^0	0^0	22.5^0	45^0	0^0	22.5^0	45^0	0^0	22.5^0	45^0
	Ak	0.34	0.32	0.25	0.76	0.70	0.56	1.05	0.96	0.77	1.51	1.36	1.10
	NC	30	30	32									
CFM 425	Vel.	1250	1328	1700									
	Tot. Pr.	1.100	0.113	0.170									
	Throw	28-39	22-30	15-21									
	NC	30	30	32									
CFM 440	Vel.	1294	1375	1760									
	Tot. Pr.	0.100	0.120	0.185									
	Throw	28-39	22-30	15-21									
	NC				31	31	32						
CFM 800	Vel.				1053	1143	1428						
	Tot. Pr.				0.076	0.100	0.162						
	Throw				37-52	28-40	20-29						
	NC				33	33	35						
CFM 865	Vel.				1138	1236	1544						
	Tot. Pr.				0.088	0.114	0.190						
	Throw				40-55	31-42	21-30						
	NC							29	29	30			
CFM 885	Vel.							852	175	1162			
	Tot. Pr.							0.054	0.075	0.113			
	Throw							37-54	35-49	21-30			
	NC							39	39	41			
CFM 1285	Vel.							1237	1359	1687			
	Tot. Pr.							0.108	0.147	0.249			
	Throw							42-66	35-50	25-37			
	NC										36	36	38
CFM 1450	Vel.										968	1071	1331
	Tot. Pr.										0.073	0.103	0.169
	Throw										51-73	39-56	28-40
	NC										46	46	49
CFM 2000	Vel.										1336	1477	1835
	Tot. Pr.										0.130	0.188	0.335
	Throw										61-86	54-65	33-46

"SG/W" Series Supply Air Grilles

Bard® SINCE 1914
Climate Control Solutions





Grille Size Chart			
Grille part number	Use with unit(s)	Dim. "A"	Dim. "B"
SG-1W (5"x 17")	WA121	21.25	9.25
SG-2W (8"x 20")	WA,WE,WL,WH 18-25	24.25	12.25
SG-3W (8"x 28")	SH,WA,WE,WG.WL,WH 26-37	32.25	12.25
SG-5W (10"x 30")	SH,WA,WE,WG,WL,WH 38-72	34.25	14.25
SG-10W (16" X 43")	W120AP*	47.00	20.00

Standard industry tolerances apply. Specs. are subject to change without notice.

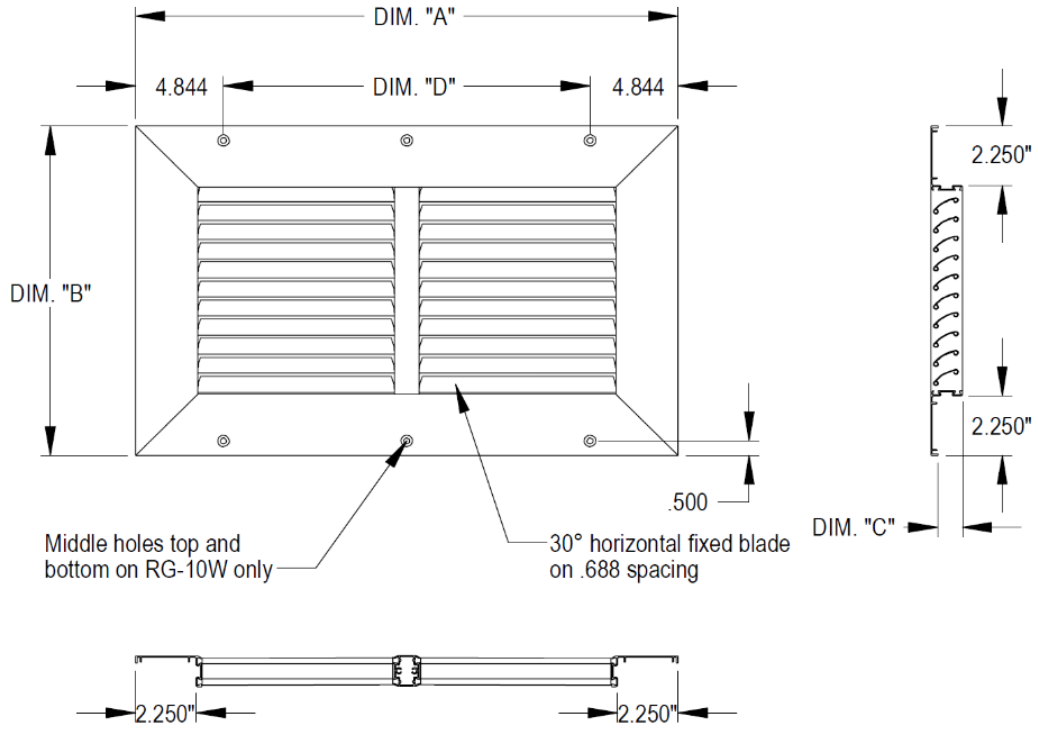
Construction: Aluminum frame - brushed anodized aluminum finish.

MIS-2430 B

NRI000599

"RG/W" Series Return Air Grilles

Bard® SINCE 1914
Climate Control Solutions

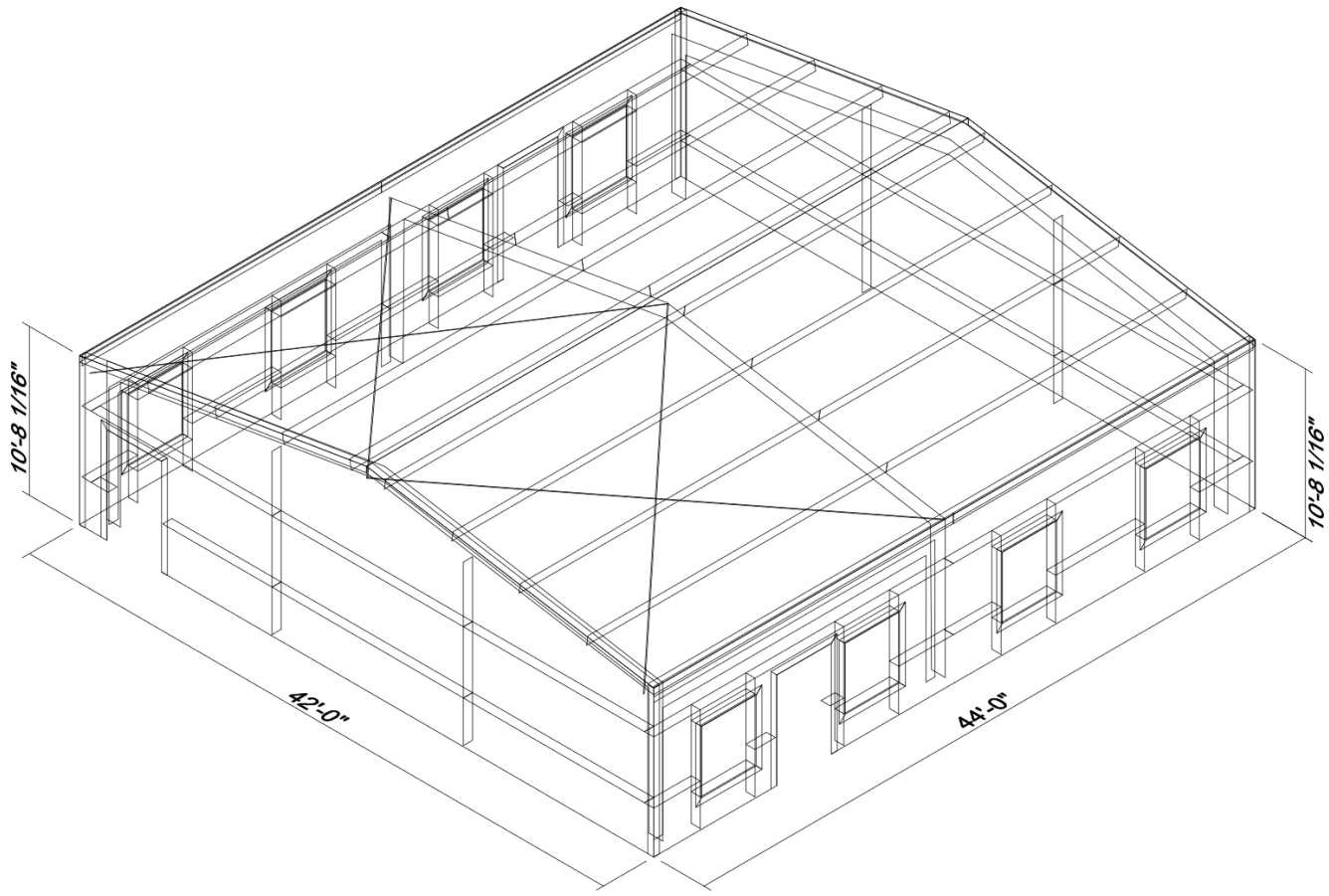


Grille Size Chart					
Grille part number	Use with unit(s)	Dim. "A"	Dim. "B"	Dim. "C"	Dim. "D"
RG-1W (10"x 17")	WA121	21.250	14.250	0.813	11.562
RG-2W (12"x 20")	WA,WE,WL,WH 18-25	24.250	16.250	0.813	14.562
RG-3W (14"x 28")	SH,WA,WE,WG.WL,WH 26-37	32.250	18.250	0.813	22.562
RG-5W (16"x 30")	SH,WA,WE,WG,WL,WH 38-72	34.250	20.250	0.813	24.562
RG-10W (22" X 43")	W120AP*	47.00	26.00	0.813	37.313

Standard industry tolerances apply. Specs. are subject to change without notice.
Construction: Aluminum frame - brushed aluminum finish.

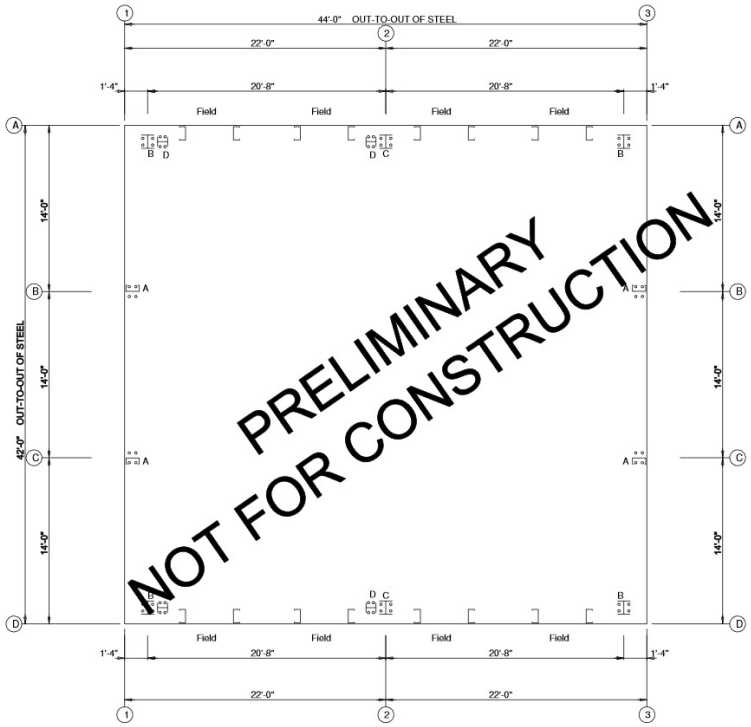
MIS-2408 B

NRI000600



NRI000601

o Dia= 3/4"



ANCHOR BOLT PLAN
NOTE: All Base Plates @ 100'-0" (U.N.)

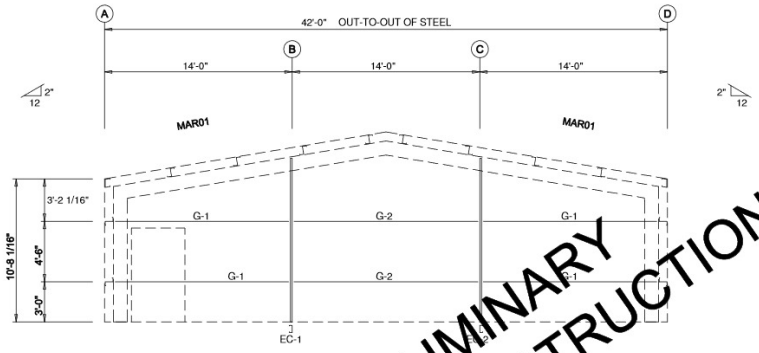
RENEGADE STEEL BUILDINGS
NR101520

CustomerName

ProjectName
Jobsite/Address
30548

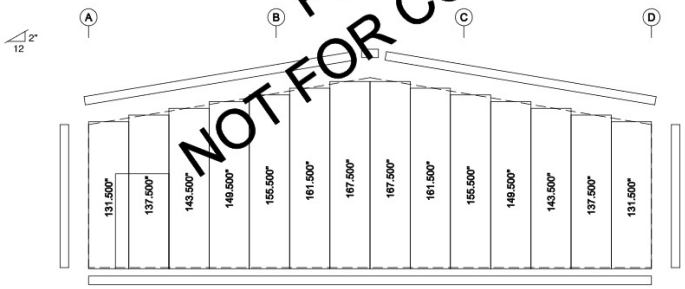
NRI000602

BOLT TABLE FRAME LINE 1				
LOCATION	QUAN	TYPE	DIA	LENGTH
Columns/Raf	8	A325	1/2"	2"



ENDWALL FRAMING: FRAME LINE 1

GIRT LOCATIONS SHOWN ARE PRELIMINARY AND SUBJECT TO CHANGE BASED ON FINAL DESIGN.



ENDWALL SHEETING & TRIM: FRAME LINE 1

PANELS: 26 Ga. CW - Undefined color C

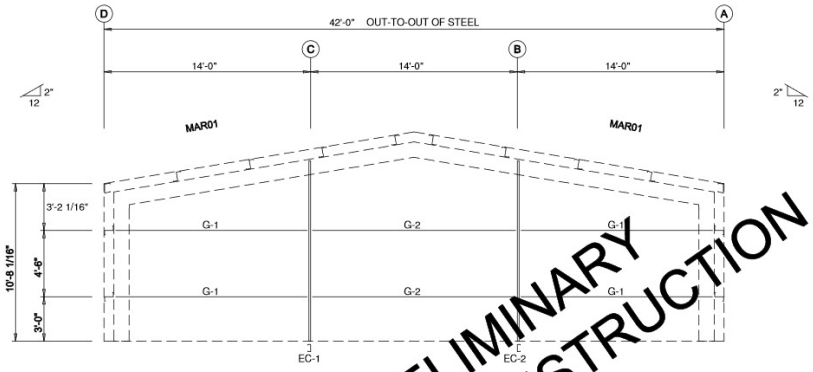
RENEGADE STEEL BUILDINGS
NR101520

CustomerName

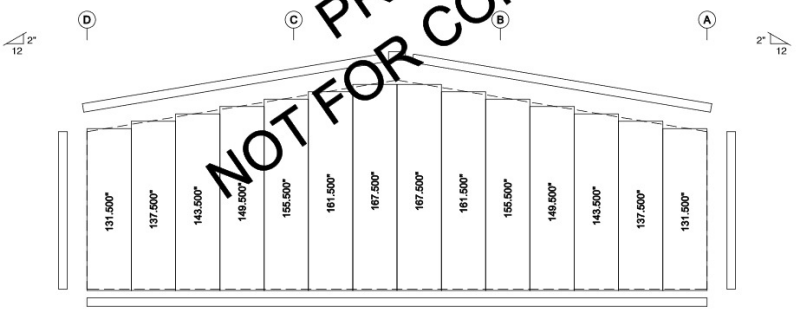
ProjectName
Jobsite/Address
30548

NRI000603

BOLT TABLE FRAME LINE 3				
LOCATION	QUAN	TYPE	DIA	LENGTH
Columns/Raf	8	A325	1/2"	2"



ENDWALL FRAMING: FRAME LINE 3



ENDWALL SHEETING & TRIM: FRAME LINE 3

PANELS: 26 Ga. CW - Undefined color C

GIRT LOCATIONS SHOWN ARE PRELIMINARY AND SUBJECT TO CHANGE BASED ON FINAL DESIGN.

PRELIMINARY NOT FOR CONSTRUCTION

RENEGADE STEEL BUILDINGS
NR101520

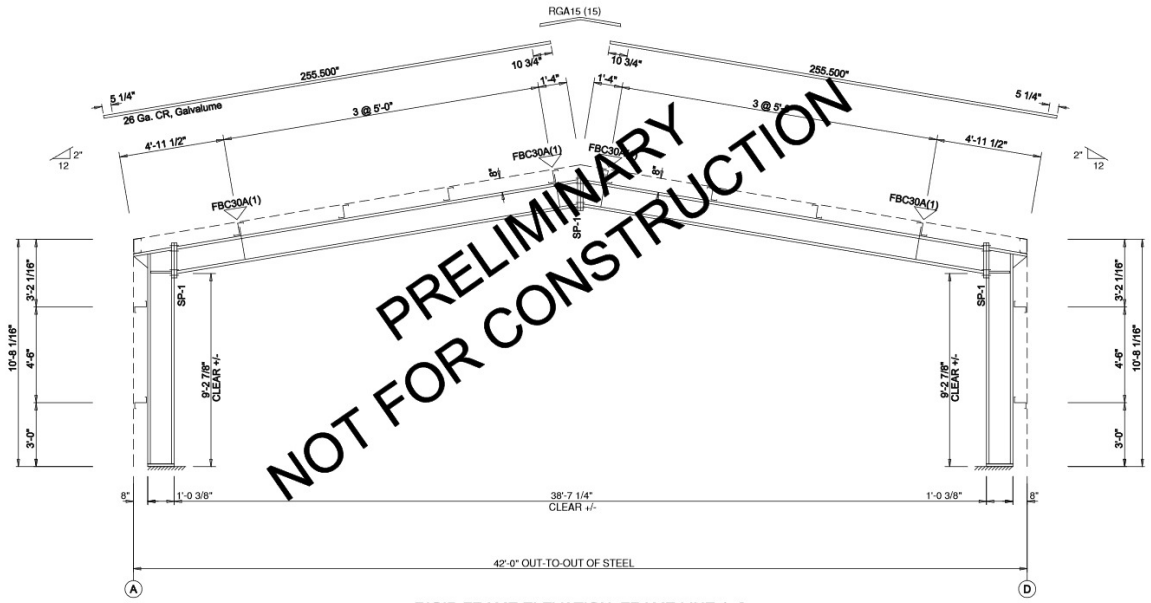
CustomerName

ProjectName
Jobsite/Address
30548

NRI000604

SPLICE PLATE & BOLT TABLE

Mark	Qty Top	Bot	Int	Type	Dia	Length	Width	Thick	Length
SP-1	4	4	0	A325	0.625	2.25	6"	3/8"	1'-6 1/8"



RIGID FRAME ELEVATION: FRAME LINE 1 3

THE CLEAR HEIGHTS SHOWN ABOVE ARE "ESTIMATED" CLEAR HEIGHTS AND ARE SUBJECT TO CHANGE BASED ON FINAL DESIGN.

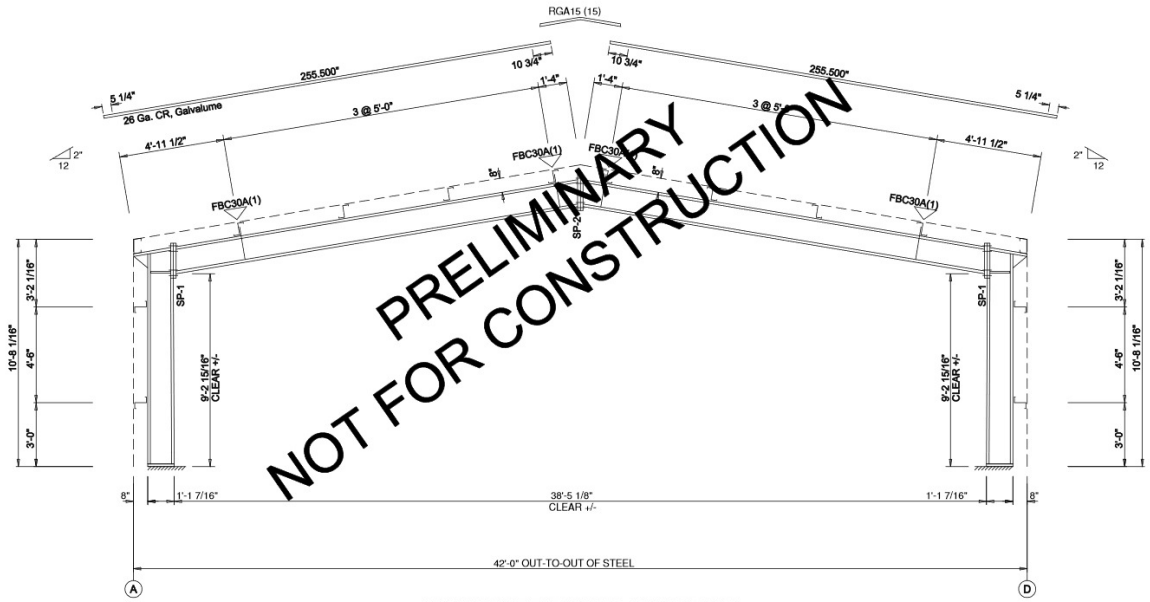
RENEGADE STEEL BUILDINGS
NR101520

CustomerName

ProjectName
JobsiteAddress
30548

NRI000605

SPLICE PLATE & BOLT TABLE									
Mark	Qty Top	Bot	Int	Type	Dia	Length	Width	Thick	Length
SP-1	4	4	0	A325	0.625	2.25	6"	1/2"	1'-6 1/4"
SP-2	4	4	0	A325	0.625	2.25	6"	3/8"	1'-6 1/8"



RIGID FRAME ELEVATION: FRAME LINE 2

PRELIMINARY
NOT FOR CONSTRUCTION

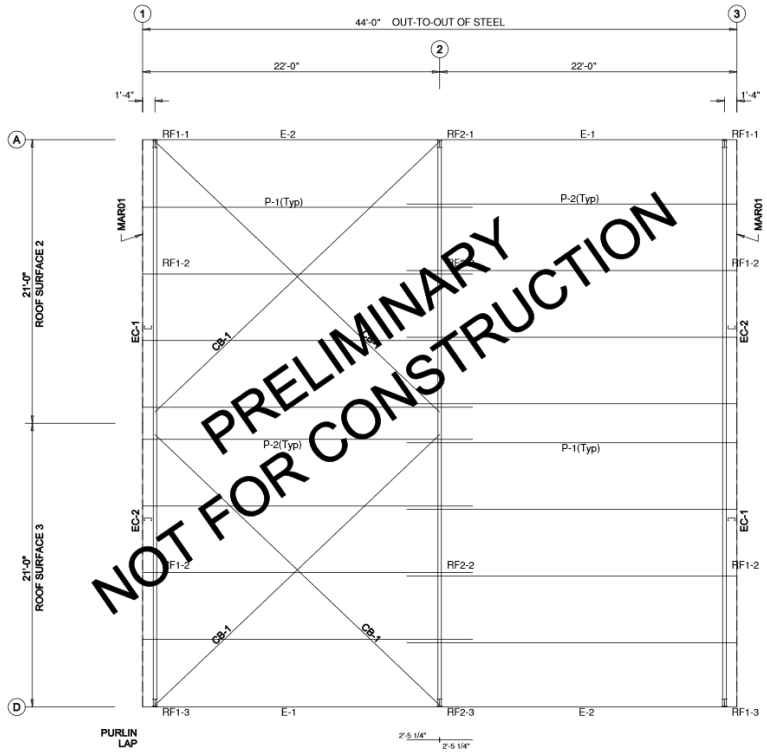
THE CLEAR HEIGHTS SHOWN ABOVE ARE "ESTIMATED" CLEAR HEIGHTS AND ARE SUBJECT TO CHANGE BASED ON FINAL DESIGN.

RENEGADE STEEL BUILDINGS
NR101520

CustomerName

ProjectName
JobsiteAddress
30548

NRI000606



ROOF FRAMING PLAN

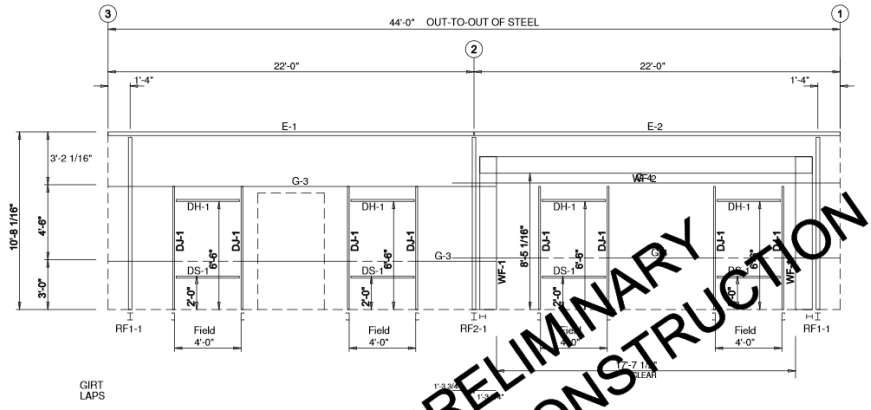
RENEGADE STEEL BUILDINGS
NR101520

CustomerName

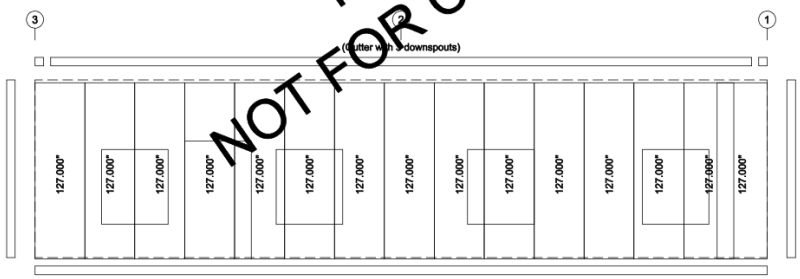
ProjectName
Jobsite/Address
30548

NRI000607

BOLT TABLE FRAME LINE A				
LOCATION	QUAN	TYPE	DIA	LENGTH
WF-1 - WF-2	8	A325	5/8"	2 1/4"
WF-1 - RF2-1	4	A325	3/4"	3"
WF-1 - RF1-1	4	A325	3/4"	3"



SIDEWALL FRAMING: FRAME LINE A



SIDEWALL SHEETING & TRIM: FRAME LINE A

PANELS: 26 Ga. CW - Undefined color C

GIRT LOCATIONS SHOWN ARE PRELIMINARY AND SUBJECT TO CHANGE BASED ON FINAL DESIGN.

PRELIMINARY
NOT FOR CONSTRUCTION

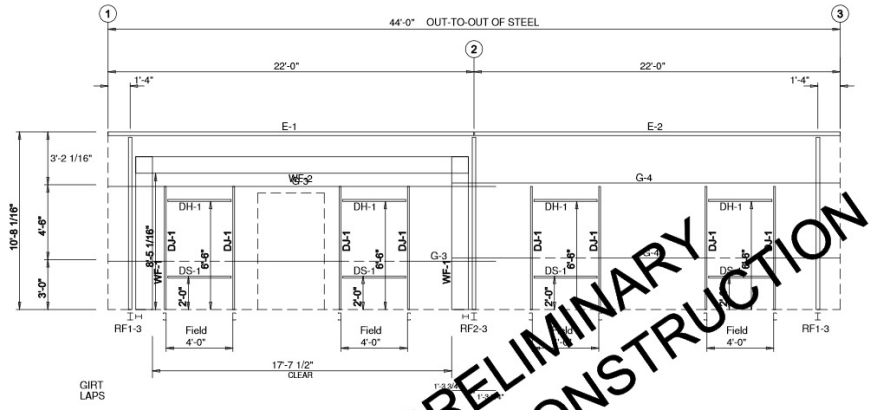
RENEGADE STEEL BUILDINGS
NR1101520

CustomerName

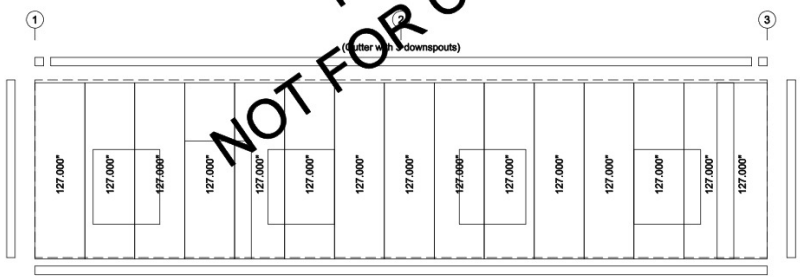
ProjectName
Jobsite/Address
30548

NRI000608

BOLT TABLE FRAME LINE D				
LOCATION	QUAN	TYPE	DIA	LENGTH
WF-1 - WF-2	8	A325	5/8"	2 1/4"
WF-1 - RF1-3	4	A325	3/4"	3"
WF-1 - RF2-3	4	A325	3/4"	3"



SIDEWALL FRAMING: FRAME LINE D



SIDEWALL SHEETING & TRIM: FRAME LINE D

PANELS: 26 Ga. CW - Undefined color C

GIRT LOCATIONS SHOWN ARE PRELIMINARY AND SUBJECT TO CHANGE BASED ON FINAL DESIGN.

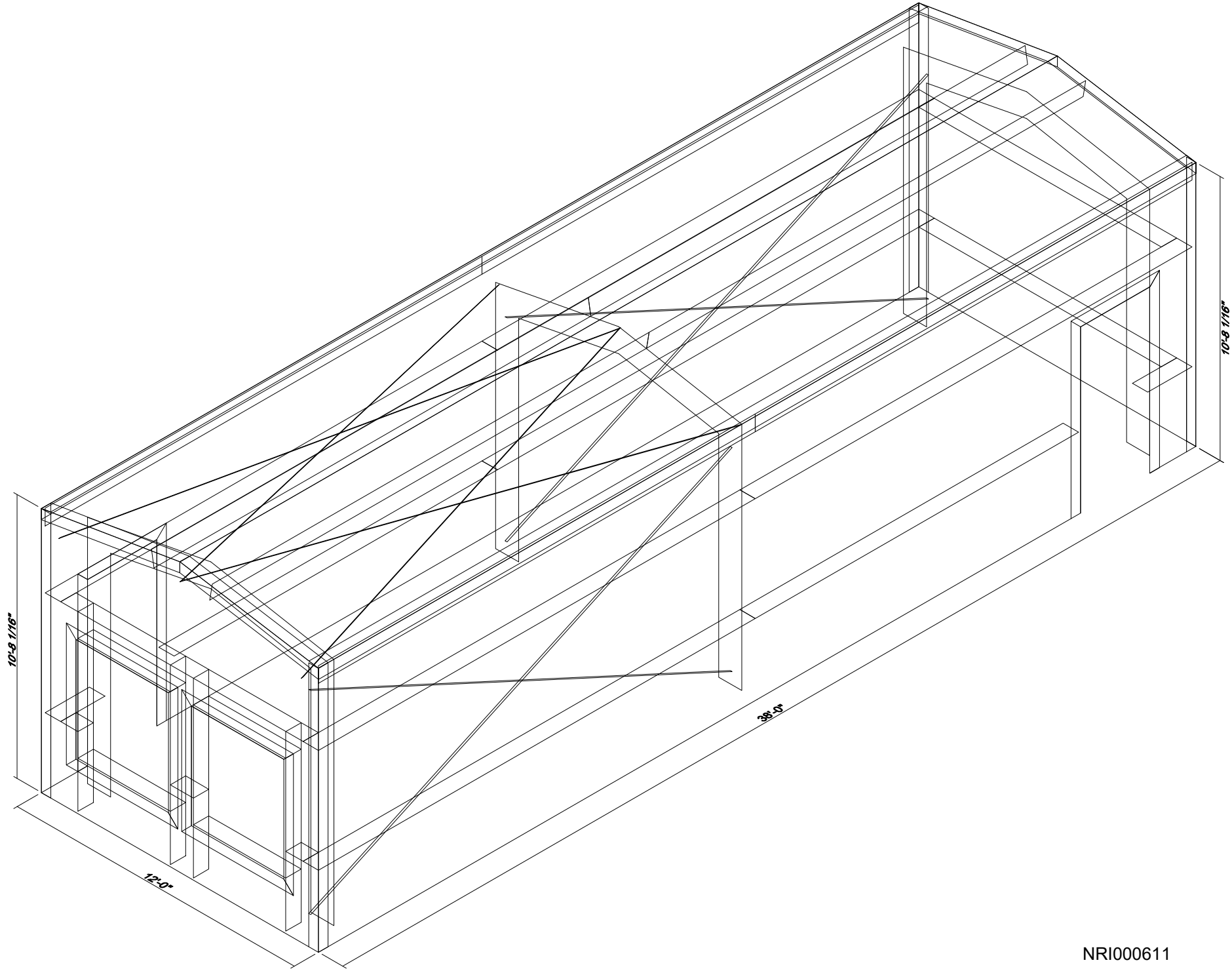
PRELIMINARY NOT FOR CONSTRUCTION

RENEGADE STEEL BUILDINGS
NR101520

CustomerName

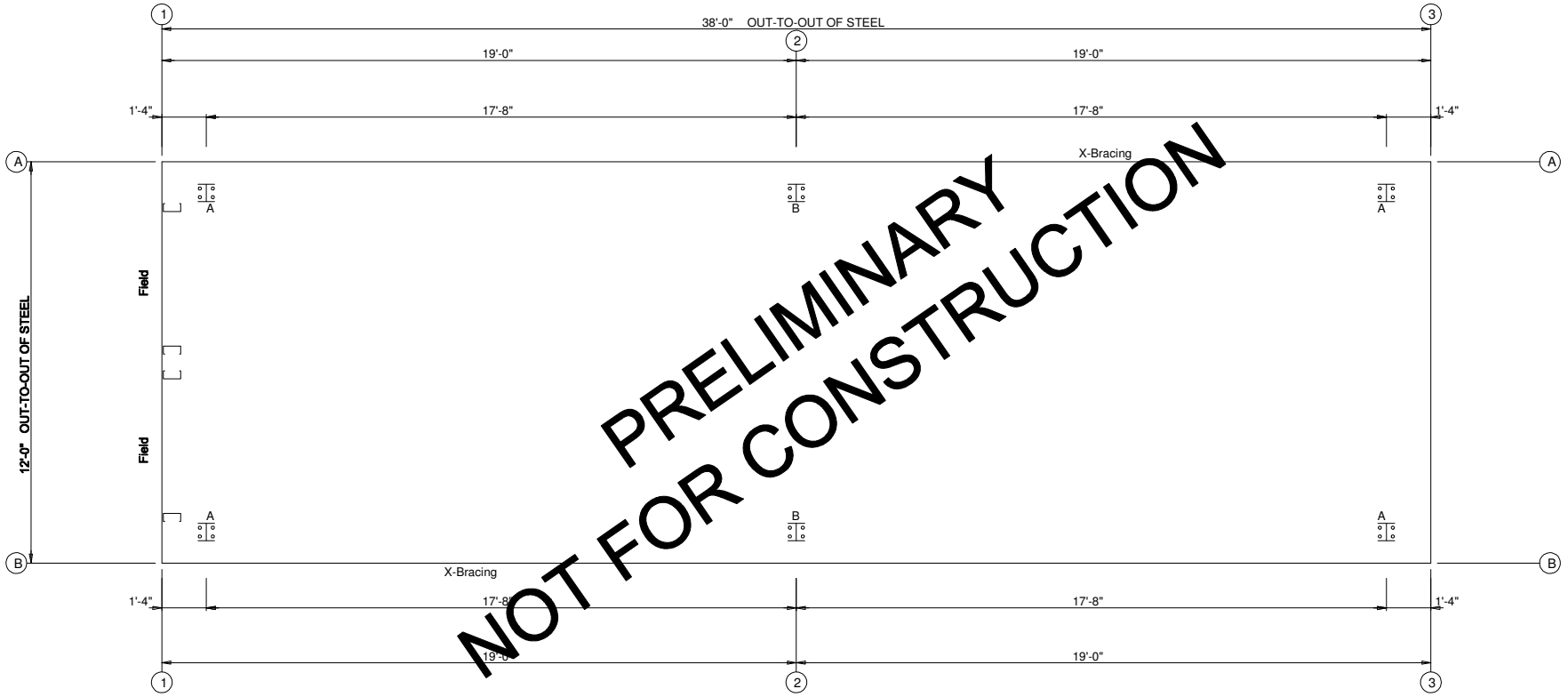
ProjectName
Jobsite/Address
30548

NRI000609



NRI000611

o Dia= 3/4"



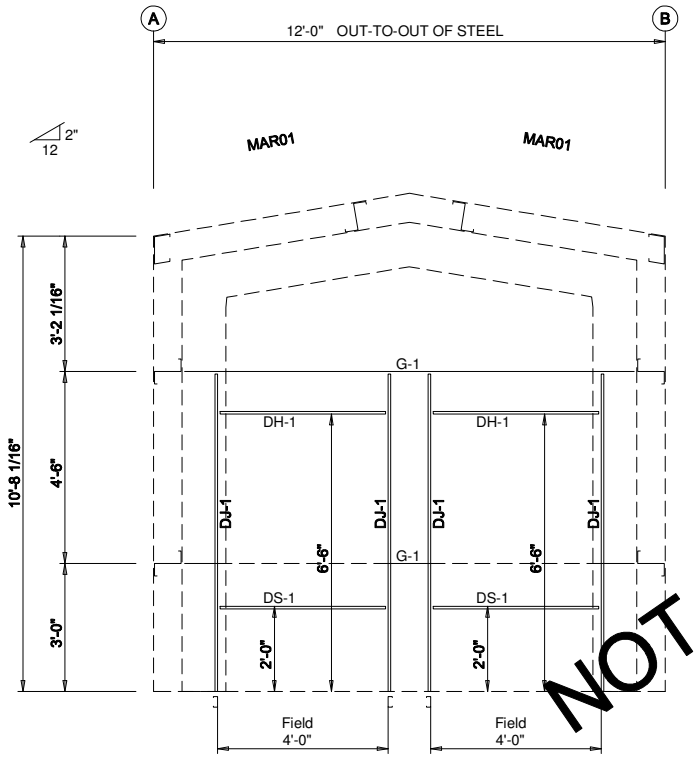
ANCHOR BOLT PLAN

NOTE: All Base Plates @ 100'-0" (U.N.)

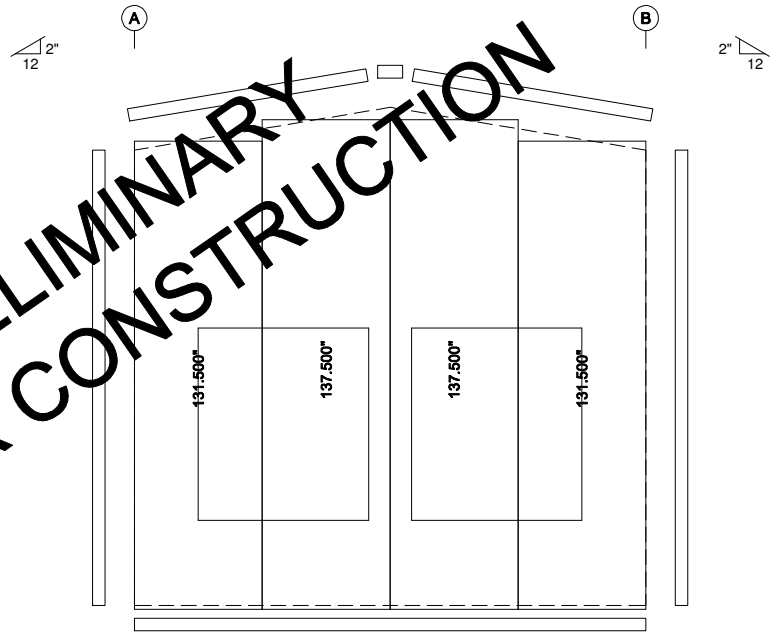
RENEGADE STEEL BUILDINGS
NR032720

CustomerName

ProjectName
JobsiteAddress
30548



ENDWALL FRAMING: FRAME LINE 1



ENDWALL SHEETING & TRIM: FRAME LINE 1

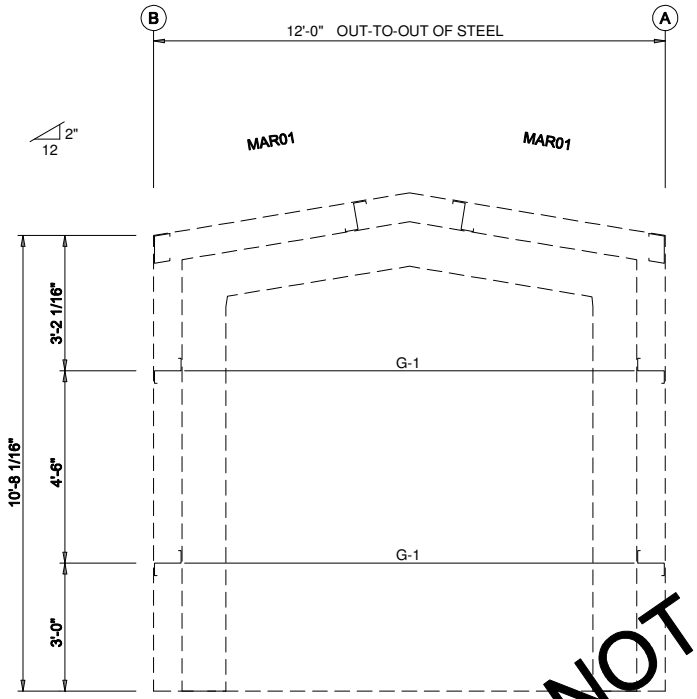
PANELS: 26 Ga. CW - Undefined color C

GIRT LOCATIONS SHOWN ARE PRELIMINARY AND SUBJECT TO CHANGE BASED ON FINAL DESIGN.

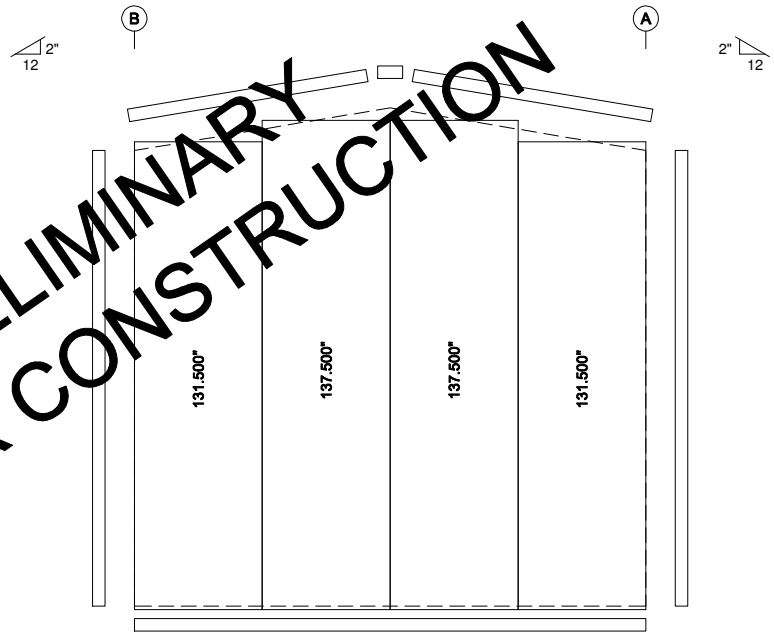
RENEGADE STEEL BUILDINGS
NR032720

CustomerName

ProjectName
JobsiteAddress
30548



ENDWALL FRAMING: FRAME LINE 3



ENDWALL SHEETING & TRIM: FRAME LINE 3

PANELS: 26 Ga. CW - Undefined color C

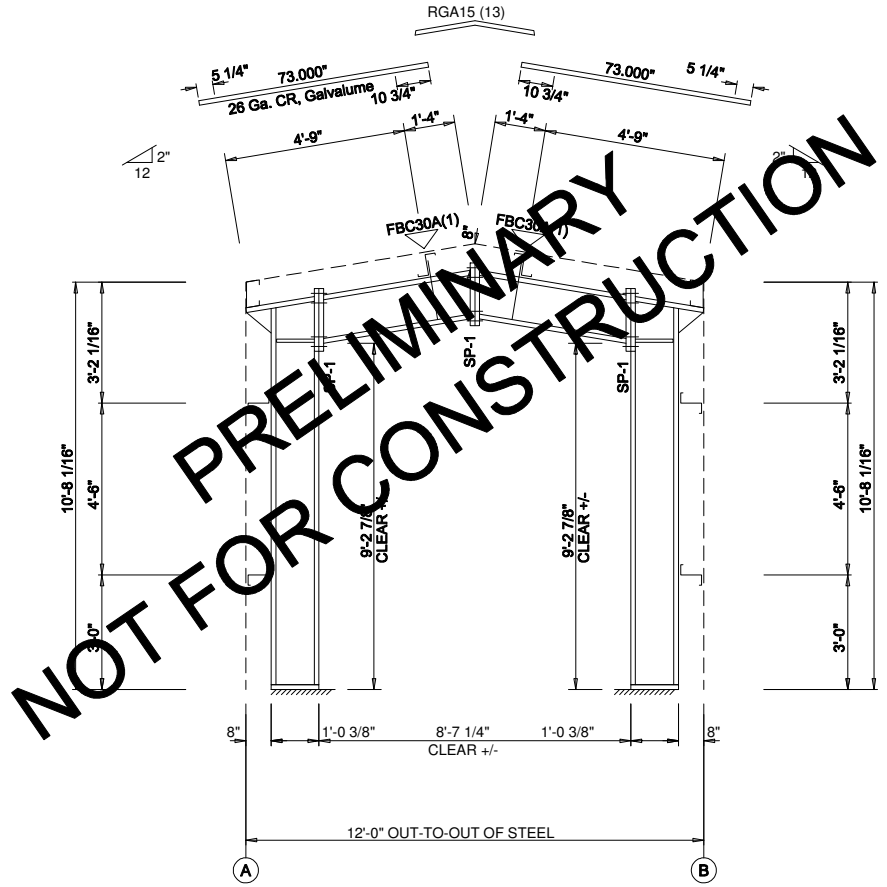
GIRT LOCATIONS SHOWN ARE PRELIMINARY AND SUBJECT TO CHANGE BASED ON FINAL DESIGN.

RENEGADE STEEL BUILDINGS
NR032720

CustomerName

ProjectName
JobsiteAddress
30548

SPLICE PLATE & BOLT TABLE									
Mark	Qty Top	Bot	Int	Type	Dia	Length	Width	Thick	Length
SP-1	4	4	0	A325	0.625	2.25	6"	3/8"	1'-6 1/8"



RIGID FRAME ELEVATION: FRAME LINE 1 3

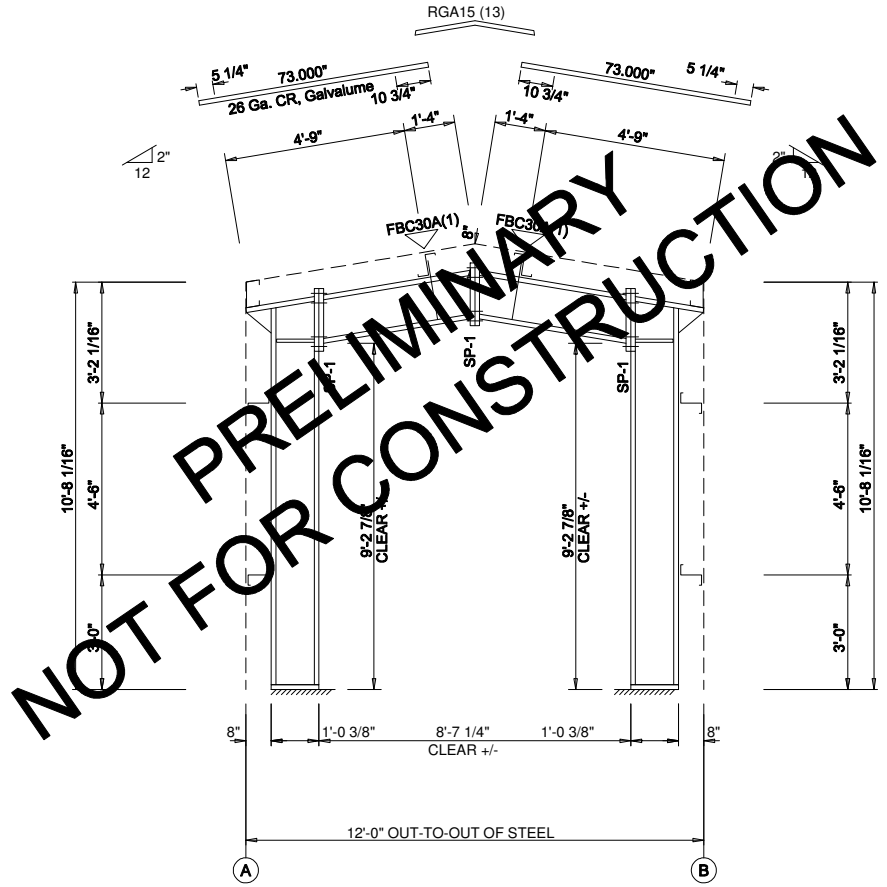
THE CLEAR HEIGHTS SHOWN ABOVE ARE "ESTIMATED" CLEAR HEIGHTS AND ARE SUBJECT TO CHANGE BASED ON FINAL DESIGN.

RENEGADE STEEL BUILDINGS
NR032720

CustomerName

ProjectName
JobsiteAddress
30548

SPLICE PLATE & BOLT TABLE									
Mark	Qty Top	Bot	Int	Type	Dia	Length	Width	Thick	Length
SP-1	4	4	0	A325	0.625	2.25	6"	3/8"	1'-6 1/8"



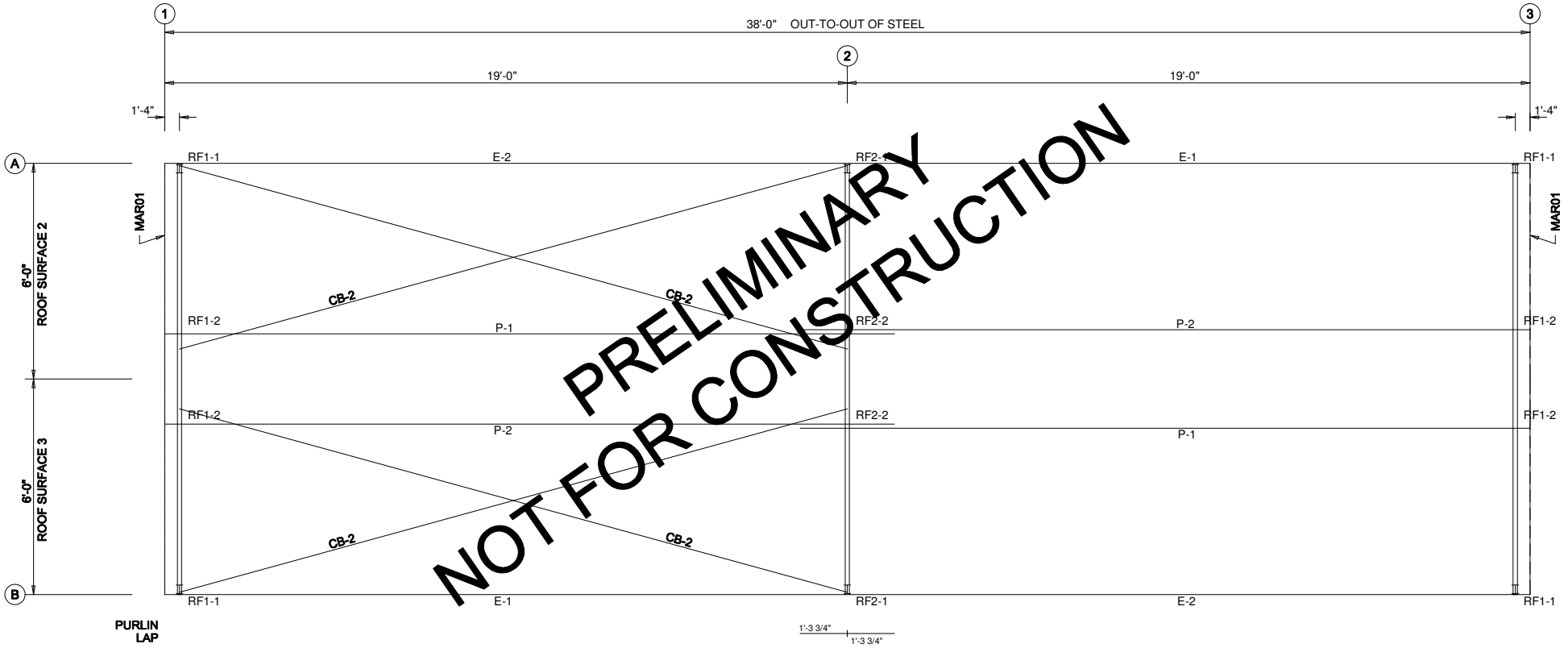
RIGID FRAME ELEVATION: FRAME LINE 2

THE CLEAR HEIGHTS SHOWN ABOVE ARE "ESTIMATED" CLEAR HEIGHTS AND ARE SUBJECT TO CHANGE BASED ON FINAL DESIGN.

RENEGADE STEEL BUILDINGS
NR032720

CustomerName

ProjectName
JobsiteAddress
30548



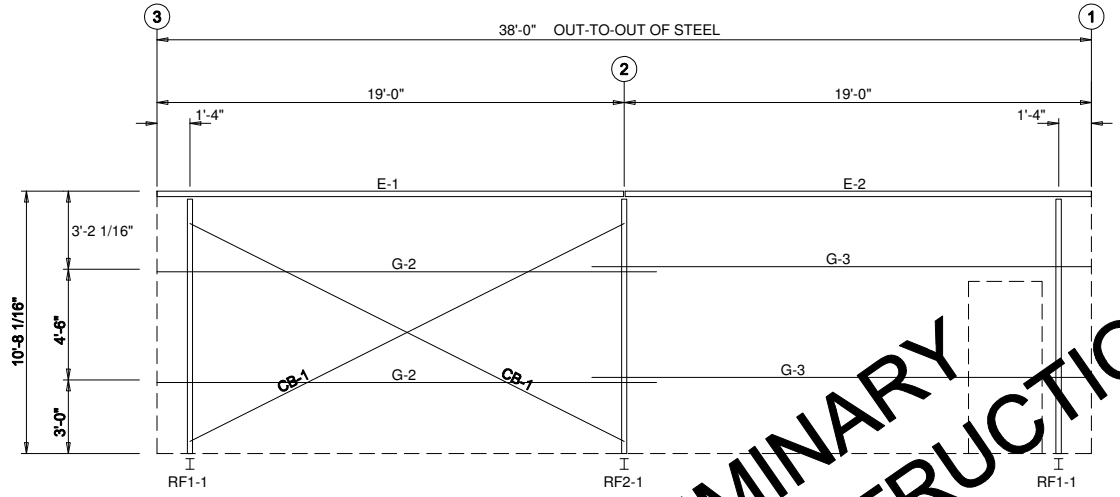
ROOF FRAMING PLAN

RENEGADE STEEL BUILDINGS
NR032720

CustomerName

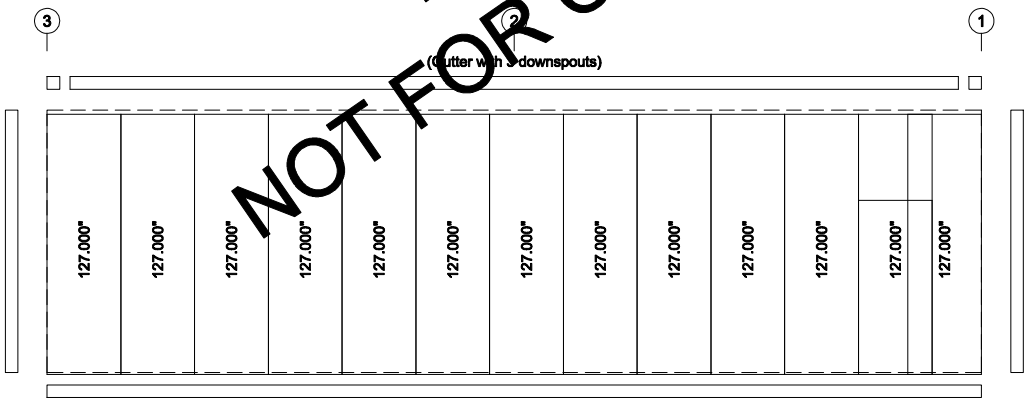
ProjectName
JobsiteAddress
30548

NRI000617



GIRT LAPS

SIDEWALL FRAMING: FRAME LINE A



SIDEWALL SHEETING & TRIM: FRAME LINE A

PANELS: 26 Ga. CW - Undefined color C

GIRT LOCATIONS SHOWN ARE PRELIMINARY AND SUBJECT TO CHANGE BASED ON FINAL DESIGN.

RENEGADE STEEL BUILDINGS
NR032720

CustomerName

ProjectName
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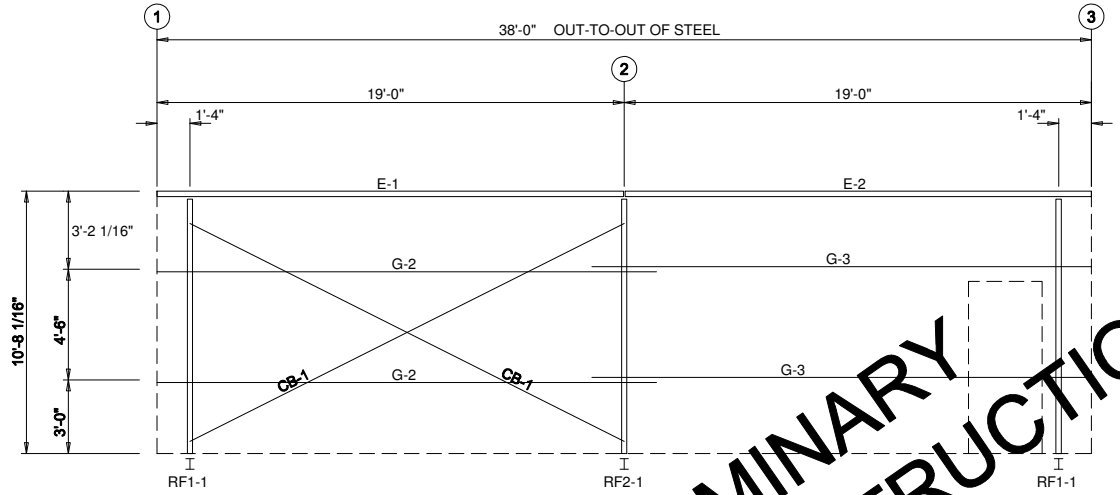
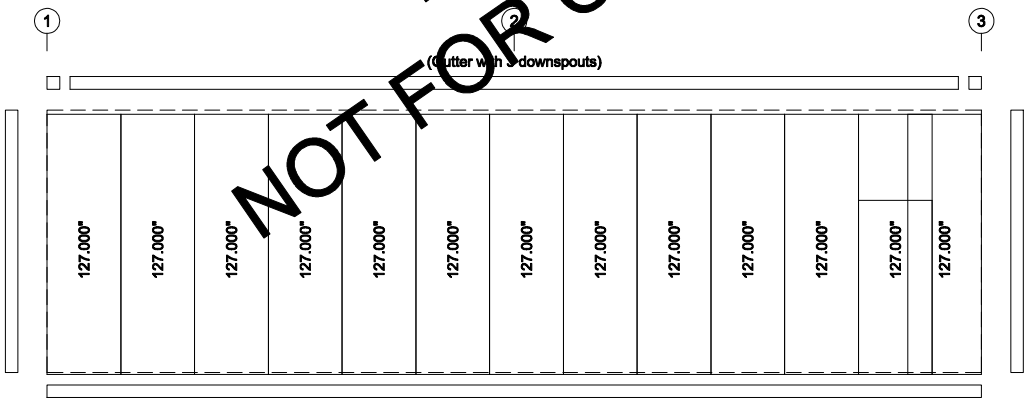
30548



SIDEWALL FRAMING: FRAME LINE B



SIDEWALL SHEETING & TRIM: FRAME LINE B

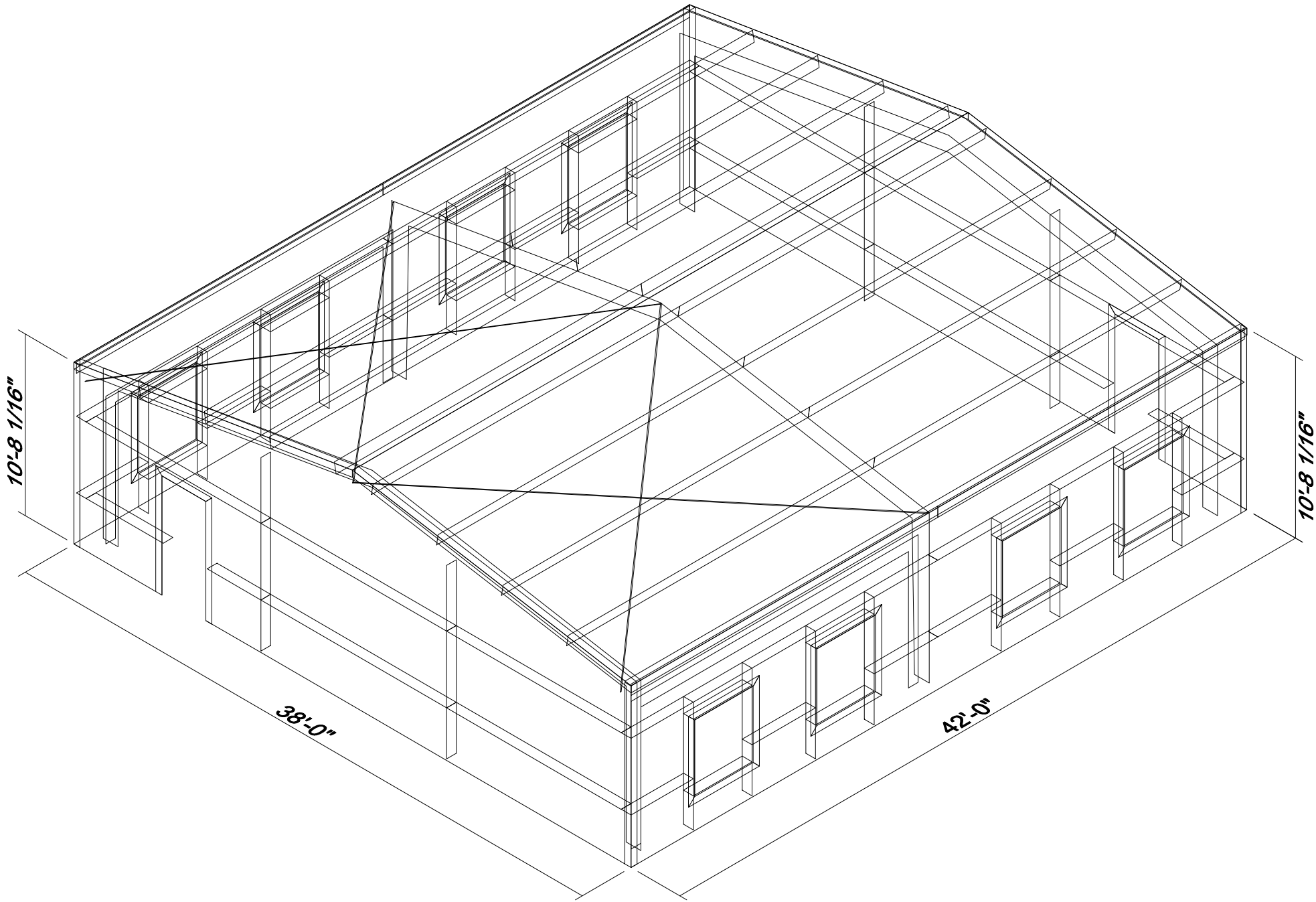
PANELS: 26 Ga. CW - Undefined color C

GIRT LOCATIONS SHOWN ARE PRELIMINARY AND SUBJECT TO CHANGE BASED ON FINAL DESIGN.

RENEGADE STEEL BUILDINGS
NR032720

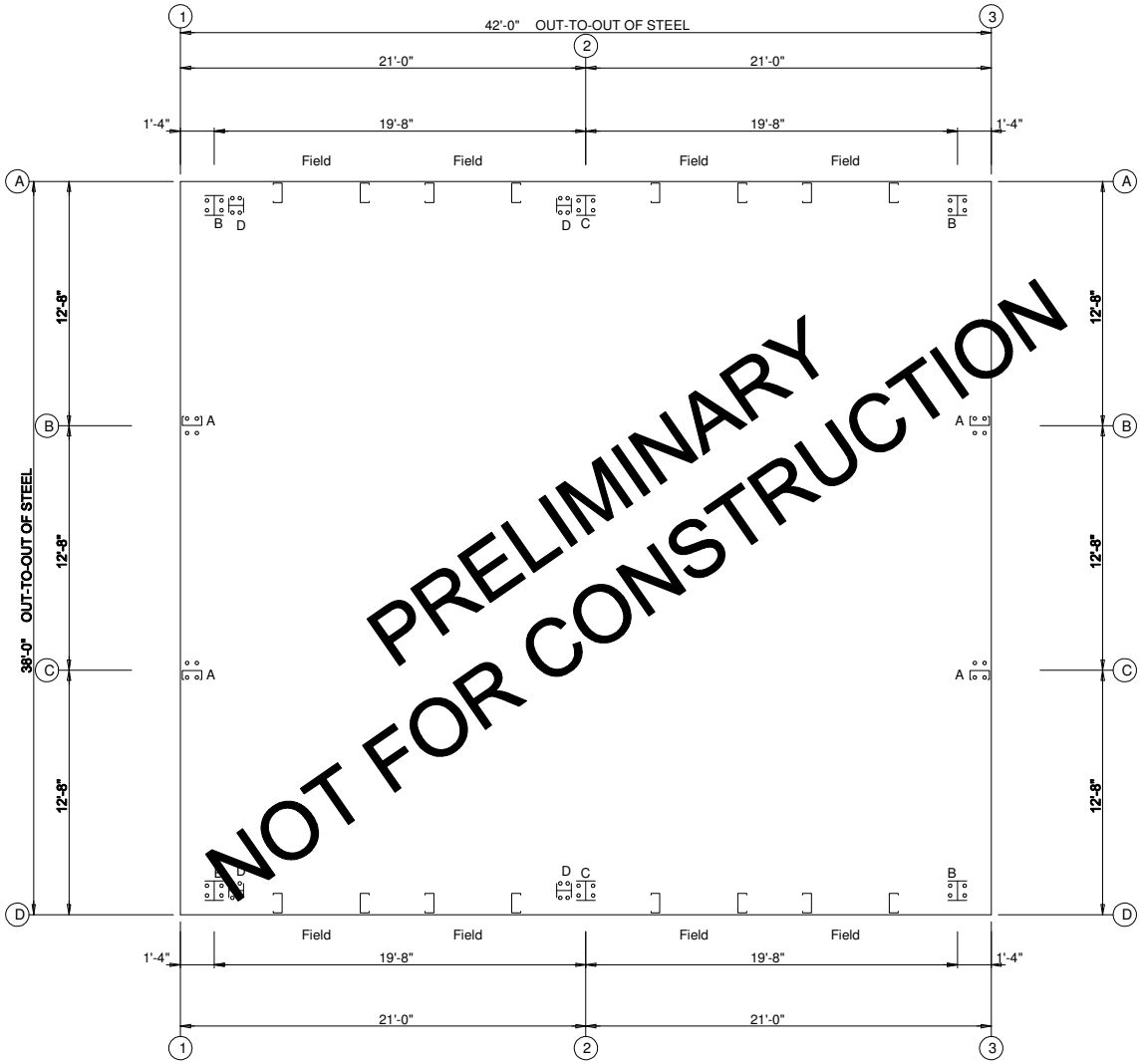
CustomerName

ProjectName
JobsiteAddress
30548



NRI000622

o Dia= 3/4"



ANCHOR BOLT PLAN

NOTE: All Base Plates @ 100'-0" (U.N.)

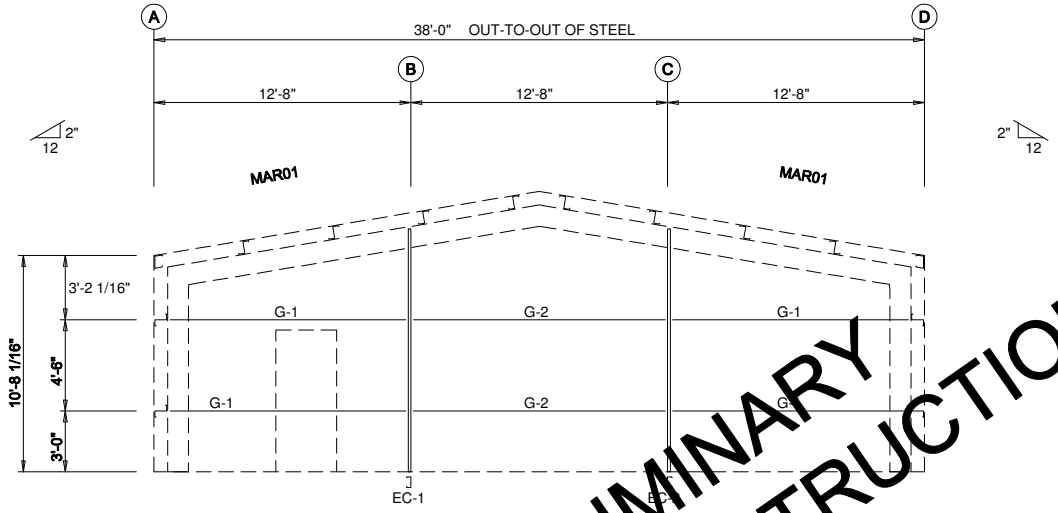
RENEGADE STEEL BUILDINGS
NR100820

CustomerName

ProjectName
JobsiteAddress
30548

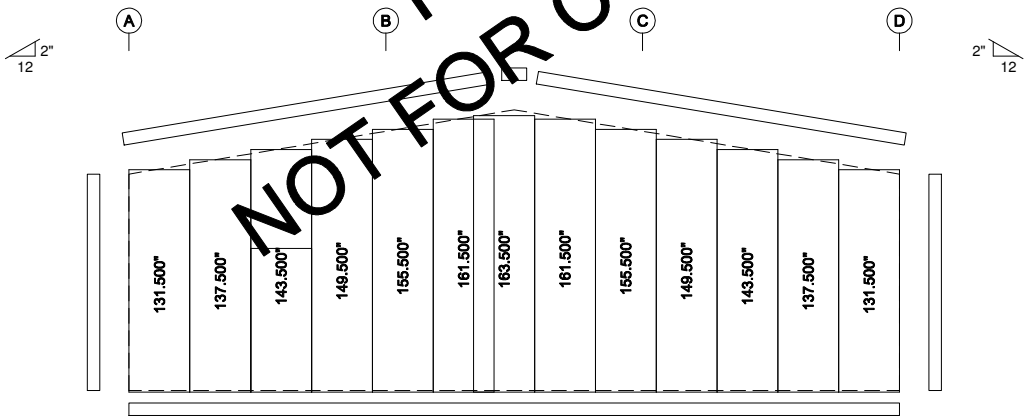
NRI000623

BOLT TABLE FRAME LINE 1				
LOCATION	QUAN	TYPE	DIA	LENGTH
Columns/Raf	8	A325	1/2"	2"



ENDWALL FRAMING: FRAME LINE 1

GIRT LOCATIONS SHOWN ARE PRELIMINARY AND SUBJECT TO CHANGE BASED ON FINAL DESIGN.



ENDWALL SHEETING & TRIM: FRAME LINE 1

PANELS: 26 Ga. CW - Undefined color C

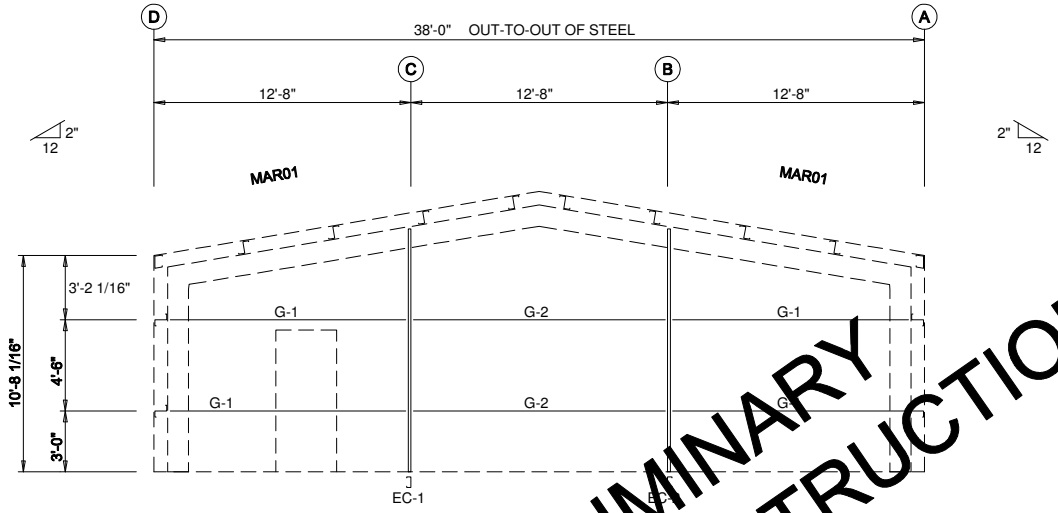
RENEGADE STEEL BUILDINGS
NR100820

CustomerName

ProjectName
JobsiteAddress
30548

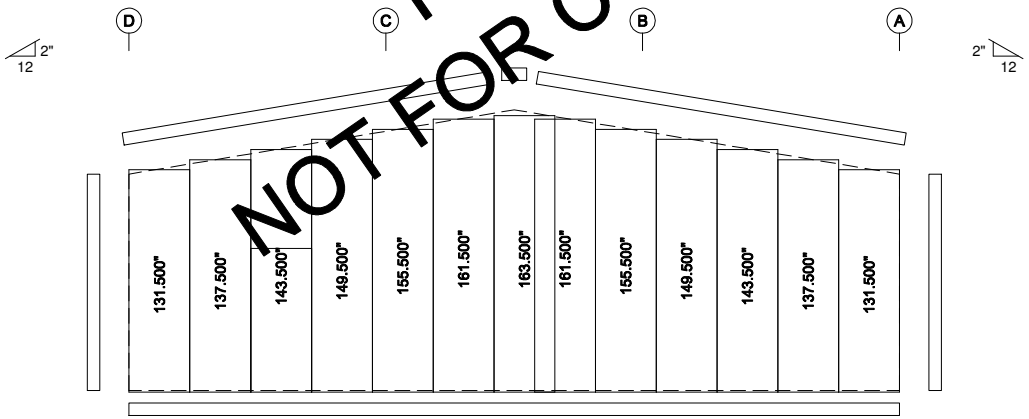
NRI000624

BOLT TABLE FRAME LINE 3				
LOCATION	QUAN	TYPE	DIA	LENGTH
Columns/Raf	8	A325	1/2"	2"



ENDWALL FRAMING: FRAME LINE 3

GIRT LOCATIONS SHOWN ARE PRELIMINARY AND SUBJECT TO CHANGE BASED ON FINAL DESIGN.



ENDWALL SHEETING & TRIM: FRAME LINE 3

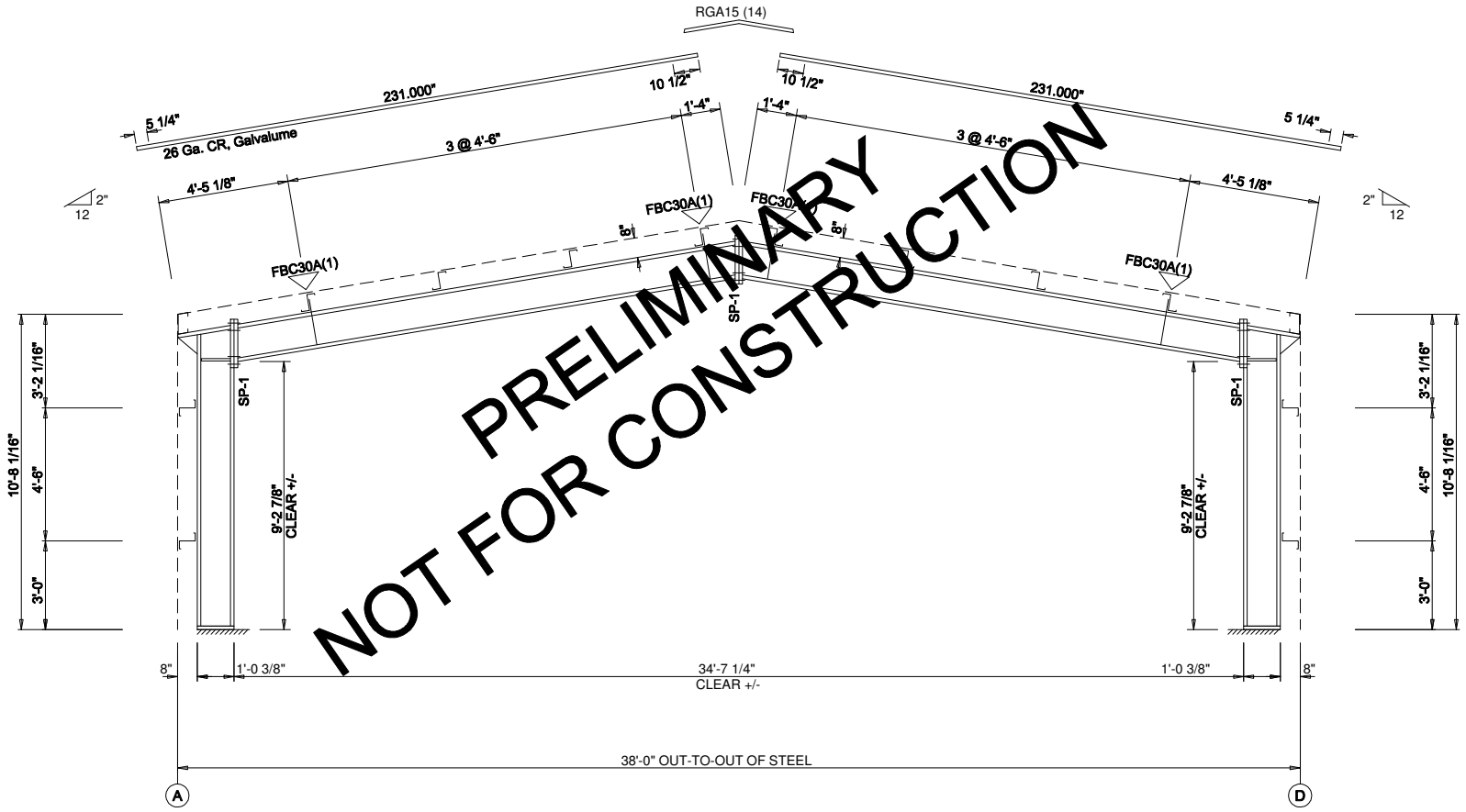
PANELS: 26 Ga. CW - Undefined color C

RENEGADE STEEL BUILDINGS
NR100820

CustomerName

ProjectName
JobsiteAddress
30548

SPLICE PLATE & BOLT TABLE									
Mark	Qty Top	Bot	Int	Type	Dia	Length	Width	Thick	Length
SP-1	4	4	0	A325	0.625	2.25	6"	3/8"	1'-6 1/8"



RIGID FRAME ELEVATION: FRAME LINE 1 3

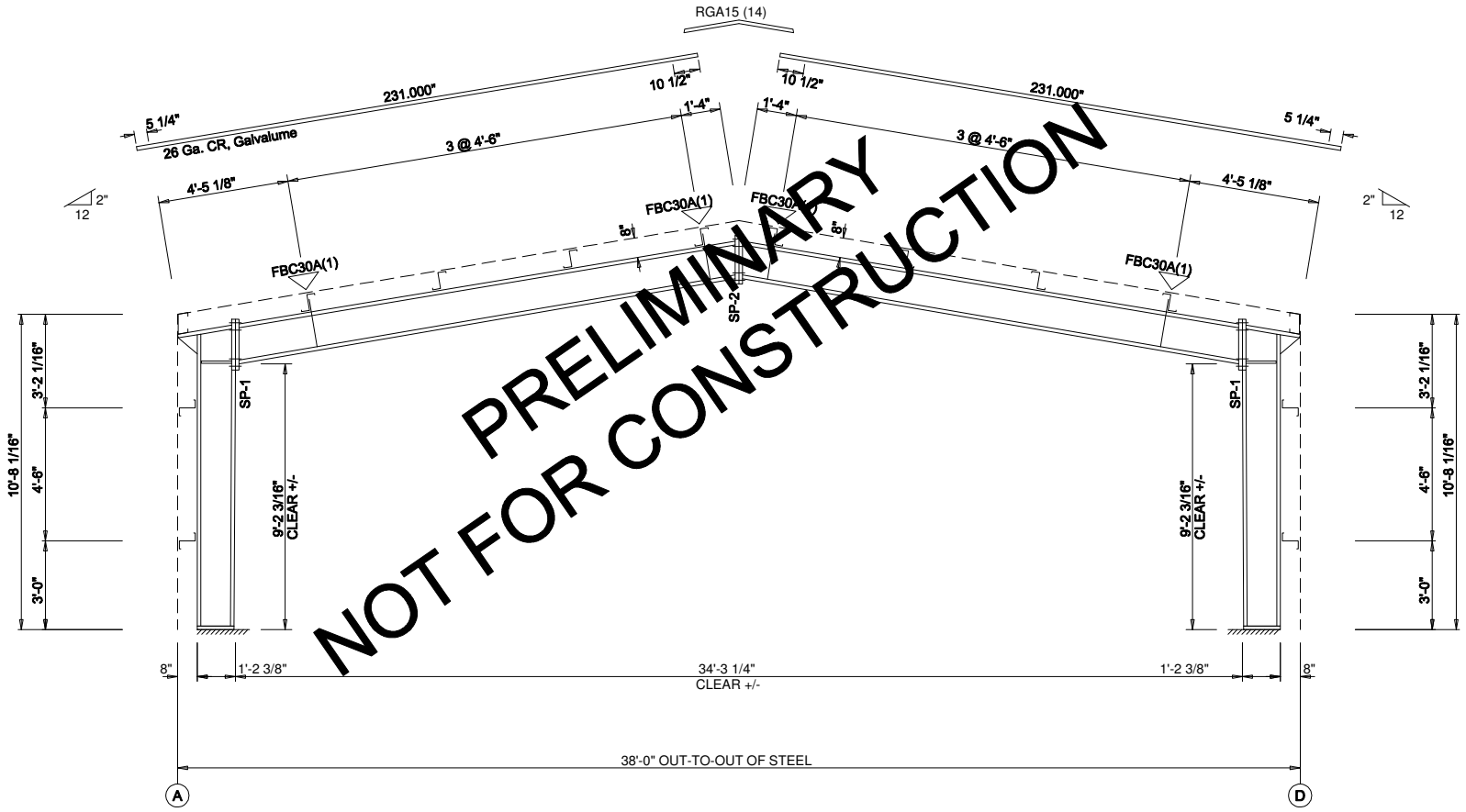
THE CLEAR HEIGHTS SHOWN ABOVE ARE "ESTIMATED" CLEAR HEIGHTS AND ARE SUBJECT TO CHANGE BASED ON FINAL DESIGN.

RENEGADE STEEL BUILDINGS
NR100820

CustomerName

ProjectName
JobsiteAddress
30548

SPLICE PLATE & BOLT TABLE									
Mark	Qty Top	Bot	Int	Type	Dia	Length	Width	Thick	Length
SP-1	4	4	0	A325	0.625	2.25	6"	3/8"	1'-7 1/8"
SP-2	4	4	0	A325	0.625	2.25	6"	3/8"	1'-6 1/8"



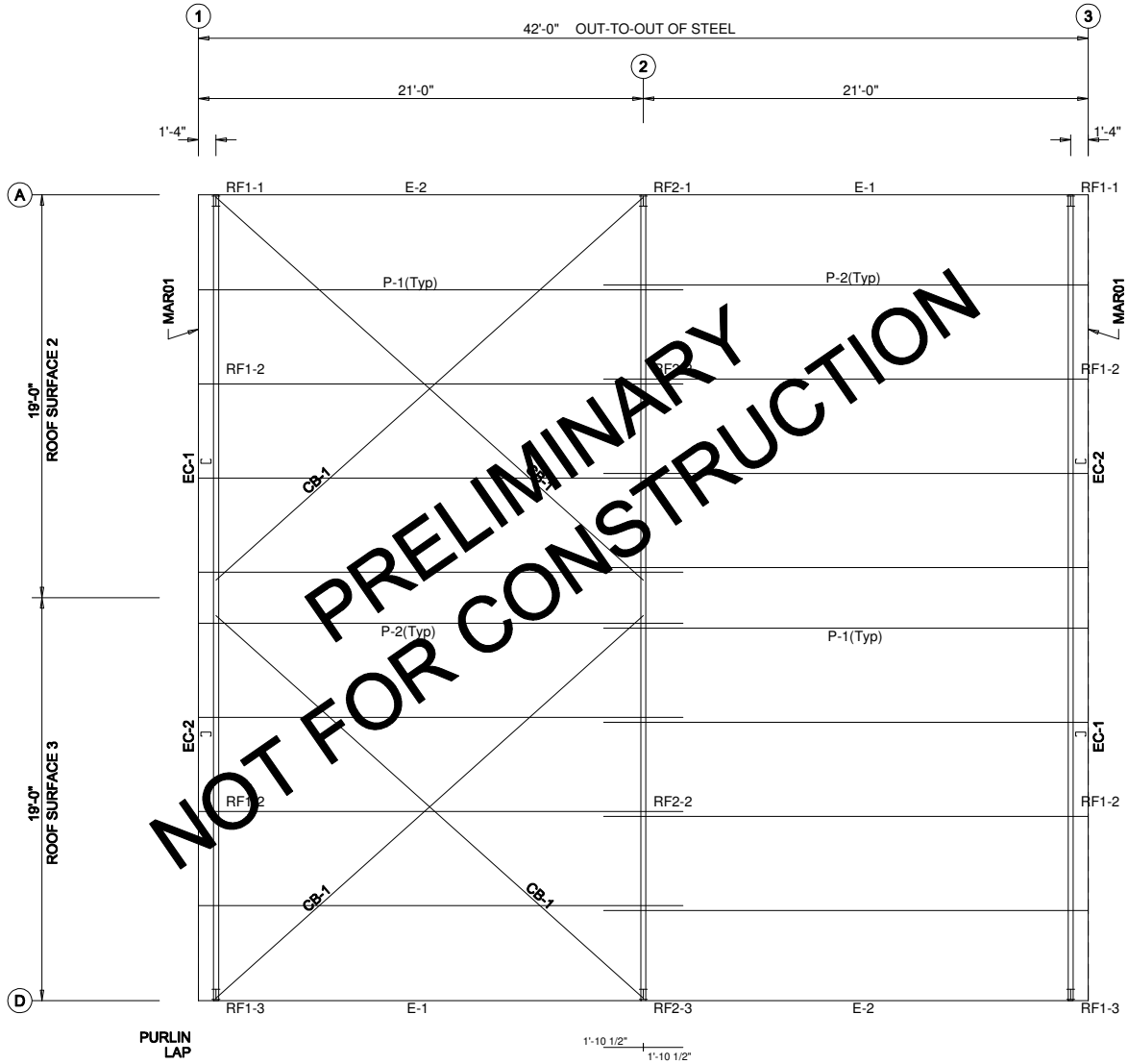
RIGID FRAME ELEVATION: FRAME LINE 2

THE CLEAR HEIGHTS SHOWN ABOVE ARE "ESTIMATED" CLEAR HEIGHTS AND ARE SUBJECT TO CHANGE BASED ON FINAL DESIGN.

RENEGADE STEEL BUILDINGS
NR100820

CustomerName

ProjectName
JobsiteAddress
30548



ROOF FRAMING PLAN

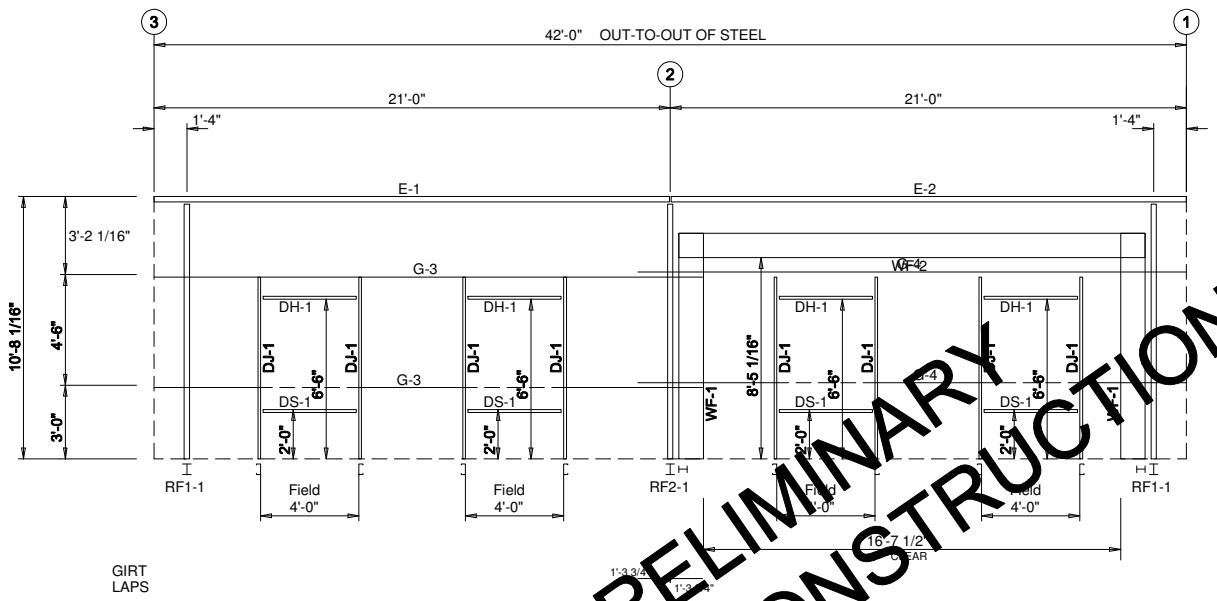
RENEGADE STEEL BUILDINGS
NR100820

CustomerName

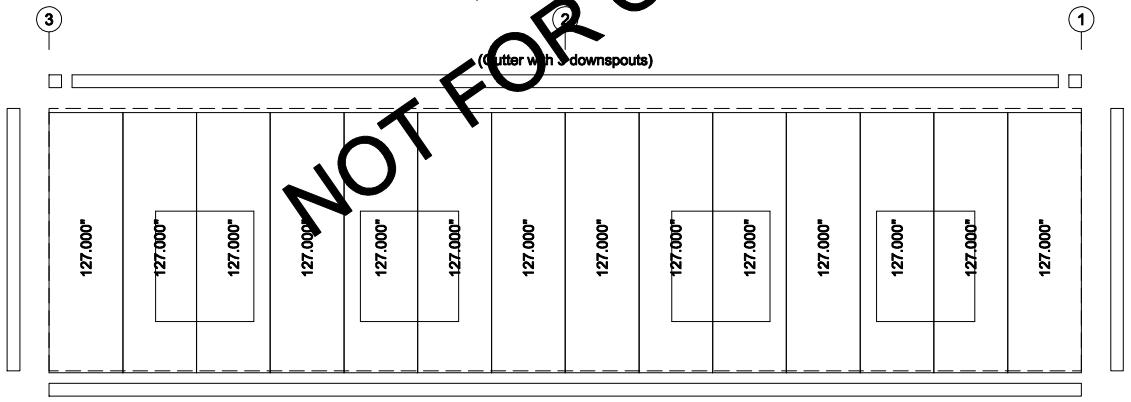
ProjectName
JobsiteAddress
30548

NRI000628

BOLT TABLE FRAME LINE A				
LOCATION	QUAN	TYPE	DIA	LENGTH
WF-1 - WF-2	8	A325	5/8"	2 1/4"
WF-1 - RF2-1	4	A325	3/4"	3"
WF-1 - RF1-1	4	A325	3/4"	3"



SIDEWALL FRAMING: FRAME LINE A



SIDEWALL SHEETING & TRIM: FRAME LINE A

PANELS: 26 Ga. CW - Undefined color C

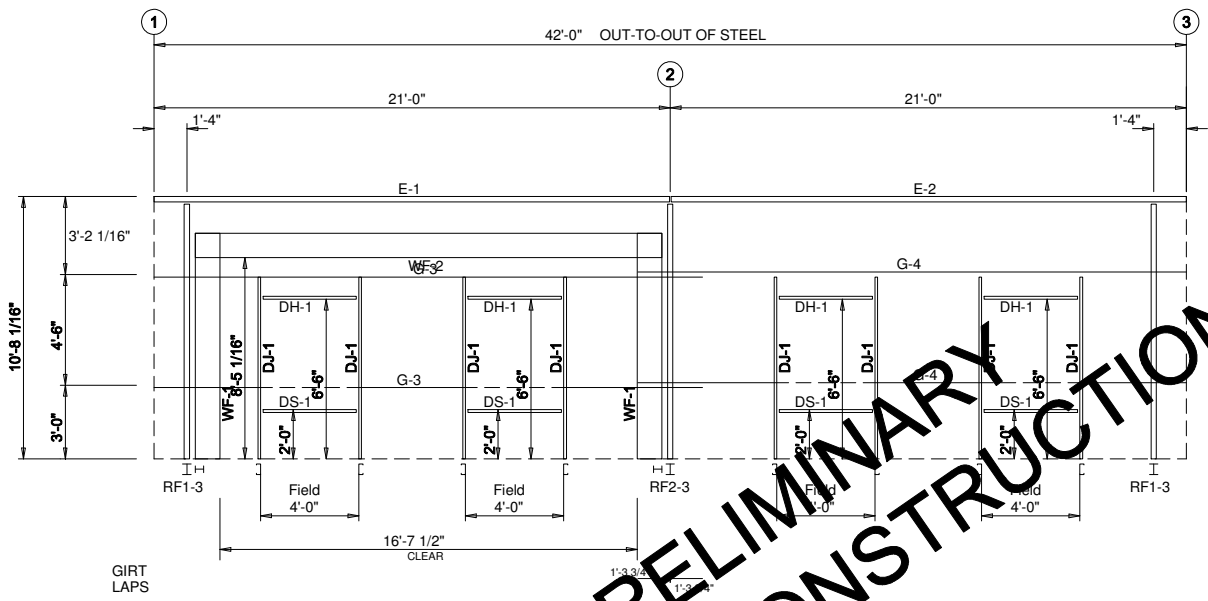
GIRT LOCATIONS SHOWN ARE PRELIMINARY AND SUBJECT TO CHANGE BASED ON FINAL DESIGN.

RENEGADE STEEL BUILDINGS
NR100820

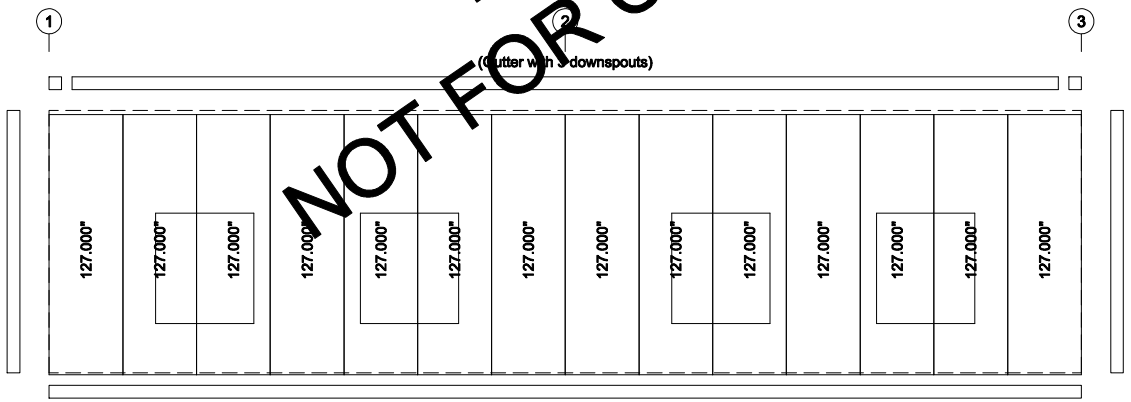
CustomerName

ProjectName
JobsiteAddress
30548

BOLT TABLE FRAME LINE D				
LOCATION	QUAN	TYPE	DIA	LENGTH
WF-1 - WF-2	8	A325	5/8"	2 1/4"
WF-1 - RF1-3	4	A325	3/4"	3"
WF-1 - RF2-3	4	A325	3/4"	3"



SIDEWALL FRAMING: FRAME LINE D



SIDEWALL SHEETING & TRIM: FRAME LINE D

PANELS: 26 Ga. CW - Undefined color C

GIRT LOCATIONS SHOWN ARE PRELIMINARY AND SUBJECT TO CHANGE BASED ON FINAL DESIGN.

RENEGADE STEEL BUILDINGS
NR100820

CustomerName

ProjectName
JobsiteAddress
30548

NRI000630