PRELIMINARY PLANS - NOT FOR CONSTRUCTION

PORTSIDE SOLAR

ST. CLAIR COUNTY, MICHIGAN
FORT GRATIOT TOWNSHIP
SPECIAL LAND USE PERMIT - SITE PLANS

APPLICANT:

PORTSIDE SOLAR, LLC
226 N. MORGAN STREET
SUITE 200
CHICAGO, IL 60607
PHONE: (734) 474-1623
ATTN: TOBY VALENTINO

CONSULTANT:

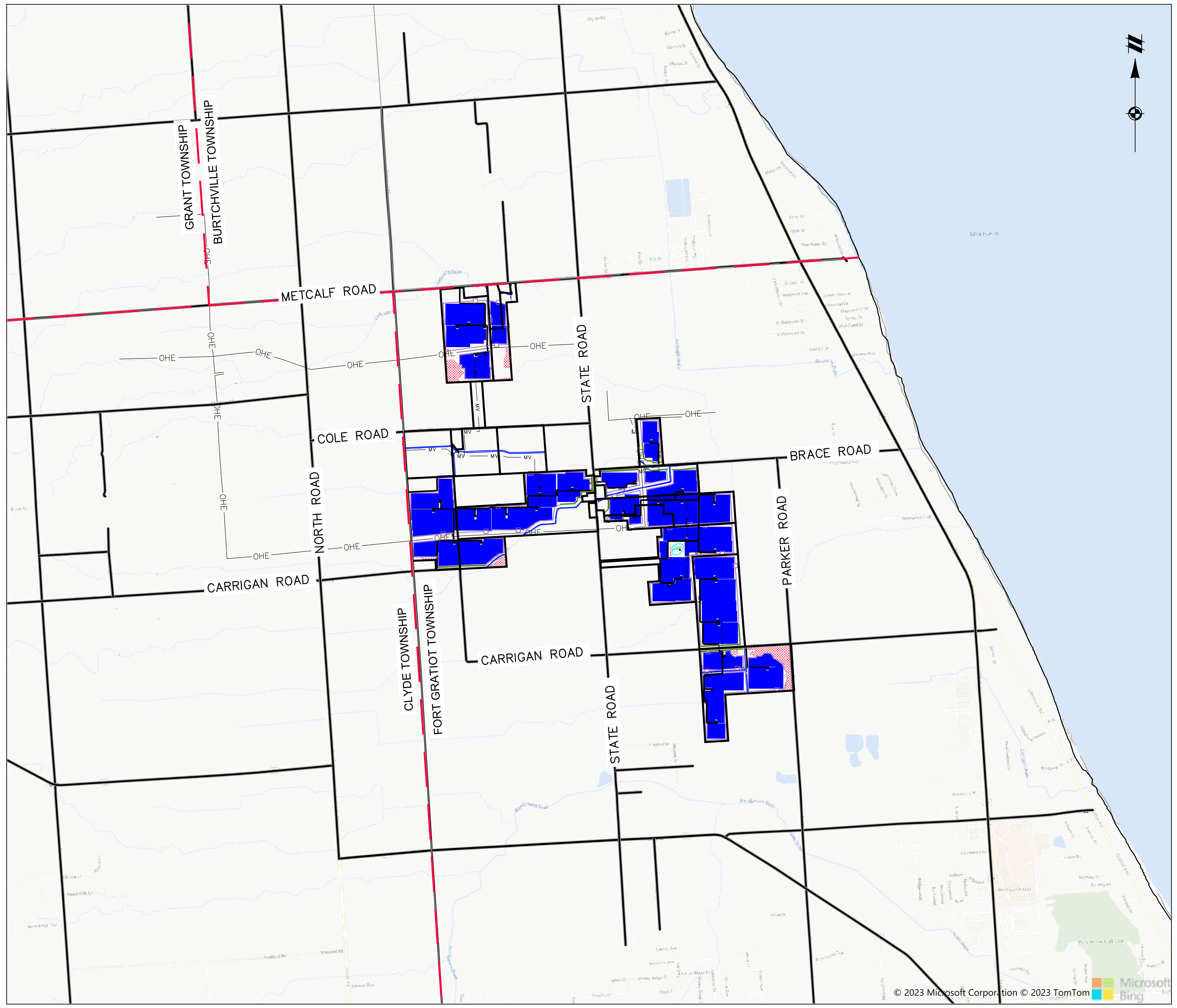
ATWELL, LLC
TWO TOWNE SQUARE, SUITE 700
SOUTHFIELD, MICHIGAN 48076
PHONE: 248.447.2000
FAX: 248.447.2001
PROJ. MGR: ERNEST SCHENK
ENGINEERING: CRAIG KANTOLA, PE
SURVEYING: CHRIS KELLY, PS

PROJECT SUMMARY:

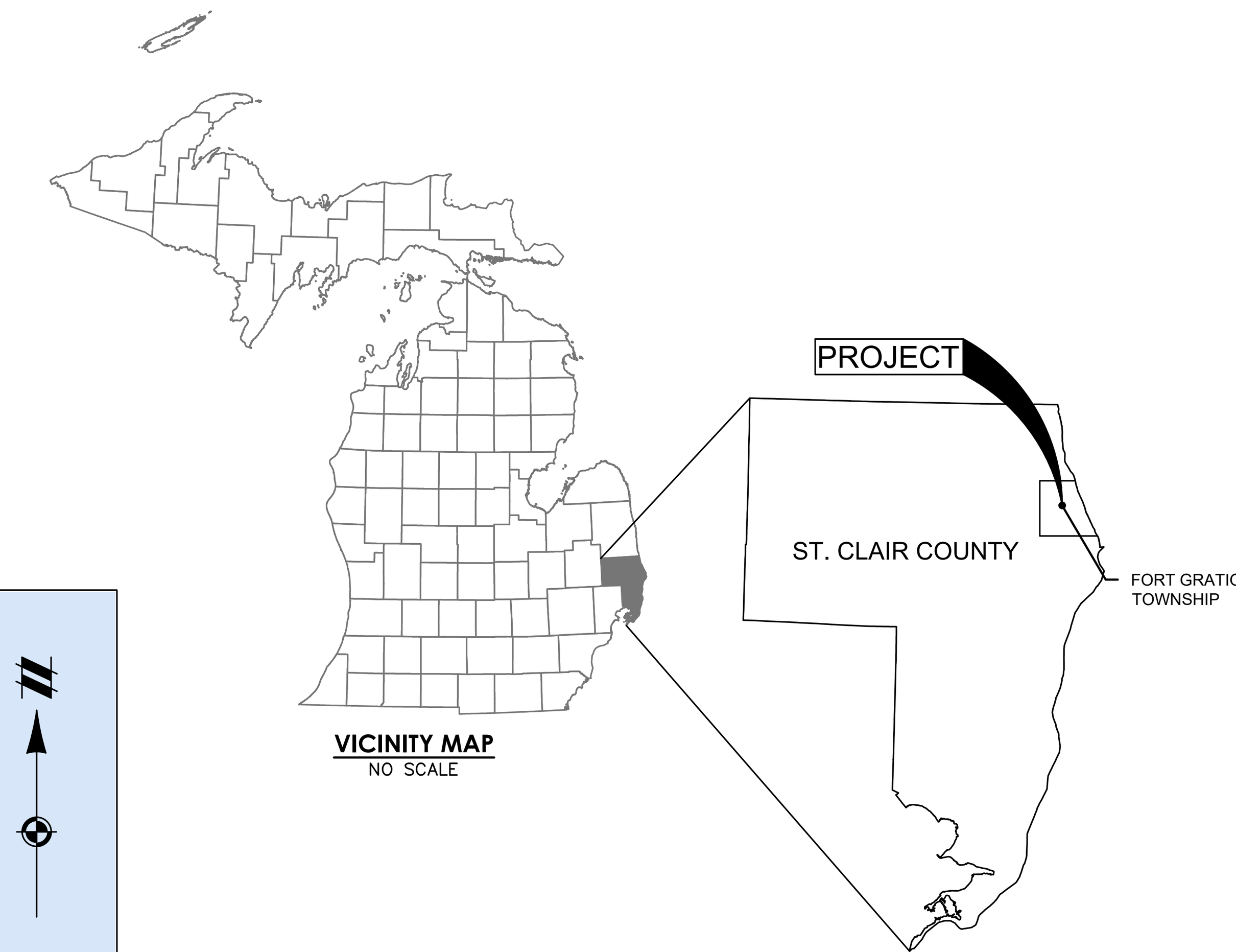
COUNTY: ST. CLAIR
TOWNSHIP: FORT GRATIOT
THIS PERMIT APPLICATION COVERS THE FOLLOWING PROPOSED PROJECT FACILITIES:

- SOLAR ARRAY (PANELS AND INVERTERS), UNDERGROUND COLLECTION LINES (PERMANENT)
- PERIMETER FENCING (PERMANENT)
- ACCESS ROADS (PERMANENT)

SEE SHEET 17 FOR ADDITIONAL GENERAL NOTES AND STANDARDS FOR THE PROJECT.



SITE VICINITY MAP
SCALE 1" = 2,000'



VICINITY MAP
NO SCALE

PLAN INFORMATION / DATA SOURCES:

PLAN INFORMATION	DATA SOURCES
TOPOGRAPHICAL INFORMATION	USGS NATIONAL ELEVATION DATASET (NED), 3 METER DEM
	DRAIN MAPS PER COUNTY RECORDS
WETLAND DELINEATION	PROVIDED BY ATWELL (FIELD WORK COMPLETED IN MAY AND JUNE 2023)
PROPERTY BOUNDARY INFORMATION	GIS PERFORMED BY ATWELL, LLC (APRIL 2023)
PARCEL PARTICIPATION	PROVIDED BY RANGER POWER (JUNE 2023)
SOLAR ARRAY AND INVERTER LOCATIONS	DESIGNED BY ATWELL (JULY 2023)
PROPOSED ACCESS ROADS	DESIGNED BY ATWELL (JULY 2023)
ELECTRICAL COLLECTION LINE	DESIGNED BY ATWELL (JULY 2023)

Sheet List Table

811 Know what's **below.** **Call** before you dig.

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ATWELL
866.850.4200 www.atwell-group.com
TWO TOWNE SQUARE, SUITE 700
SOUTHFIELD, MI 48076
248.447.2000

SECTIONS: 5–8, 17
TOWN, RANGE: T07N, R17E
FORT GRATIOT TOWNSHIP
ST. CLAIR COUNTY, MICHIGAN

CLIENT: **PORTSIDE SOLAR, LLC**
PROJECT: **PORTSIDE SOLAR**
SPECIAL LAND USE PERMIT – SITE PLANS
COVER SHEET

DATE: 8/17/2023

REVISIONS

DR. MB | CH. ES
P.M. ES
BOOK --
JOB 22005894
SHEET NO. **01**

CAD FILE: FORT GRATIOT-01-CV.DWG

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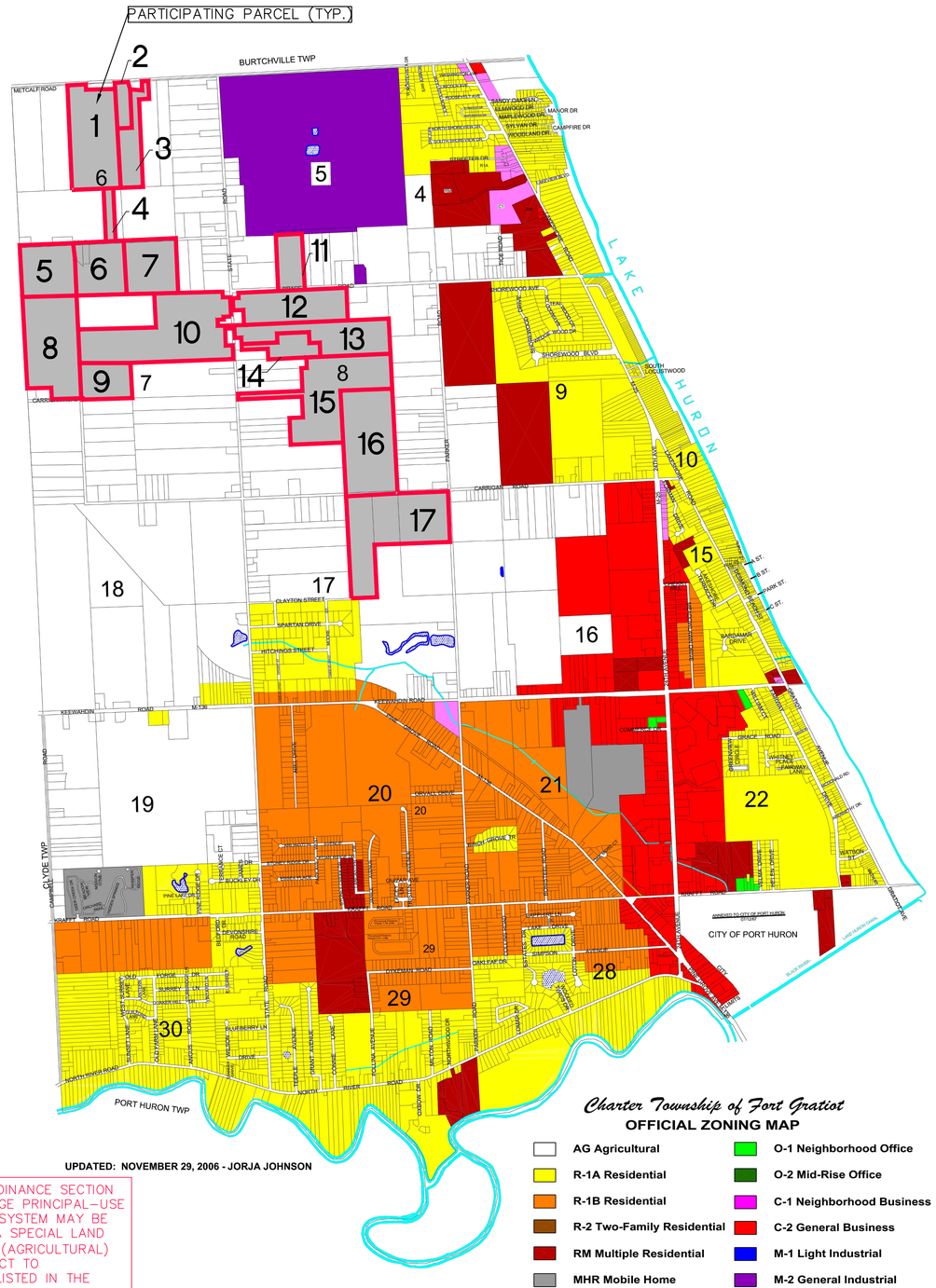

UPDATED: NOVEMBER 29, 2006 - JORJA JOHNSON

PER ZONING ORDINANCE SECTION 38-639: A LARGE PRINCIPAL-USE SOLAR ENERGY SYSTEM MAY BE PERMITTED AS A SPECIAL LAND USE IN THE AG (AGRICULTURAL) DISTRICT, SUBJECT TO REQUIREMENTS LISTED IN THE ORDINANCE.

Charter Township of Fort Gratiot

OFFICIAL ZONING MAP

AG Agricultural	O-1 Neighborhood Office
R-1A Residential	O-2 Mid-Rise Office
R-1B Residential	C-1 Neighborhood Business
R-2 Two-Family Residential	C-2 General Business
RM Multiple Residential	M-1 Light Industrial
MHR Mobile Home	M-2 General Industrial

ZONING MAP

NOT TO SCALE

NOTE: ALL PARTICIPATING PARCELS LOCATED WITHIN AG AGRICULTURAL

Parcel	PIN	OWNER	LEGAL DESCRIPTION PER TITLE	Acreage
1	74-20-006-1002-010	JAMES R. PALMATEER	BEG S 01D 27M 47S E 330.14' FROM N 1/4 COR AS MONUMENTED, TH S 01D 27M 47S E 2416.32', TH N 89D 57M 14S W 1318.65', TH N 01D 27M 05S W 2705.44', TH N 88D 16M 12S E 657.65', TH S 01D 27M 48S E 330', TH N 88D 16M 10S E 660' TO BEG SECTION 6 T7N R17E 77.471A	82.32
2	74-20-006-2001-100	JAMES R. PALMATEER	Land in the Northeast Fractional 1/4 of Section 6, Town 7 North, Range 17 East, Fort Gratiot Township, St. Clair County, Michigan described as- Beginning at the North 1/4 of Section 6; thence South 88 degrees 00 minutes East 303 feet along the North line of Section 6; thence South 20.0 feet; thence South 15 Degrees 00 minutes East 245 feet; thence South 02 degrees 57 minutes West 975.46 feet; thence North 88 degrees 00 minutes West 365.00 feet; thence North 02 degrees 16 minutes 20 seconds East 1227.0 feet along the North and South 1/4 line to the point of beginning.	9.99
3	74-20-006-2001-000	JAMES R. PALMATEER	Land in the Northeast 1/4 of Section 6, Town 7 North, Range 17 East, Fort Gratiot Township, St Clair County, Michigan described as: Beginning at a point distant South 88 degrees 00 minutes East 669.5 feet from the North 1/4 corner of said Section 6; thence continuing South 88 degrees 00 minutes East 165.0 feet along the North line of said Section 6; thence South 02 degrees 16 minutes 20 seconds West 500.00 feet; thence North 88 degrees 00 minutes West 310.0 feet; thence South 02 degrees 08 minutes West 2260.82 feet; thence North 86 degrees 25 minutes 42 seconds West 530.0 feet along the East and West 1/4 line to the interior corner of said Section 6; thence North 02 degrees 16 minutes 20 seconds East 1519.31 feet along the North and South 1/4 line of said Section 6; thence South 88 degrees 00 minutes East 365.00 feet; thence North 02 degrees 57 minutes East 975.46 feet; thence South 72 degrees 00 minutes East 306.00 feet; thence North 02 degrees 00 minutes East 336.0 feet to the point of beginning.	24.54
4	74-20-006-4001-400	JAMES & PAMELA REID	Part of the North half of the Southwest Fractional quarter of Section 6, Town 7 North, Range 17 East, Fort Gratiot Township, St. Clair County, Michigan, described as beginning at a point on the East West quarter line that is South 89 degrees 57 minutes 14 seconds East 1,985.85 feet from the West quarter corner of said Section 6: Thence continuing South 89 degrees 57 minutes 14 seconds East 333.47 feet; Thence South 01 degrees 26 minutes 49 seconds East 1,324.63 feet; Thence along the South line of said North half of the Southwest Fractional quarter, West 333.46 feet; Thence North 01 degree 26 minutes 49 seconds West 1,324.90 feet to the point of beginning.	10.06
5	74-20-006-4005-000	LEWIS LAND LLC	The Southwest 1/4 of the Southwest 1/4, Section 6, Town 7 North, Range 17 East; Fort Gratiot Township, St. Clair County, Michigan.	41.04
6	74-20-006-4004-000	LEWIS LAND LLC	The Southeast ¼ of the Southwest ¼. Except that part lying North and West of a line beginning on the centerline of Cole Road, 1656.4 feet East of West Section line, thence South 1 degree 23 minutes East 581 feet, West 150 feet, South 1 degree 23 minutes East 56 feet and North 42 degrees 11 minutes West 275.5 feet, Section 6, Town 7 North, Range 17 East, Fort Gratiot Township, County of St. Clair, State of Michigan.	36.46
7	74-20-006-3012-000	LEWIS LAND LLC	The Southwest ¼ of the Southeast ¼, Section 6, Town 7 North, Range 17 East, Fort Gratiot Township, County of St. Clair, State of Michigan.	40.78
8	74-20-007-1001-000	LEWIS LAND LLC	West 1/2 of Northwest 1/4 except South 330 feet of West 660 feet and except beginning North 0 degrees 16 minutes 55 seconds East 330 feet from West 1/4 corner, thence North 0 degrees 16 minutes 55 seconds East 22 feet, thence North 89 degrees 59 minutes 55 seconds East 252.96 feet; thence South 0 degrees 16 minutes 55 seconds West 28 feet, thence North 88 degrees 38 minutes 30 seconds West 253 feet to beginning, Section 7, Town 7 North, Range 17 East, 74.85 acres, Fort Gratiot Township, St. Clair County, Michigan.	76.44
9	74-20-007-1004-000	LEWIS LAND LLC	South 1/3 of East 1/2 of Northwest 1/4, Section 7, Town 7 North, Range 17 East, 26.66 acres, Fort Gratiot Township, St. Clair County, Michigan.	25.97
10	74-20-007-1003-000	THE TED E. FURNESS AND CYNTHIA A. FURNESS REVOCABLE TRUST	The middle 1/3 of Northeast 1/4 and middle 1/3 of East 1/2 of Northwest 1/4, Section 7, more commonly referred to as the East 80 acres of the North 1/2 of the South 2/3 of the North 1/2, Section 7, Town 7 North, Range 17 East, excepting therefrom, the following parcel. Commencing at the Northeast corner of said Section7; thence proceeding South West 948.32 feet along the East line of said Section 7 to the Point of Beginning of this description; thence North 90 degrees West 210 feet; thence South West 414.86 feet; thence South 90 degrees East 210 feet to the East line of said Section 7; thence North East 414.86 feet along the East line of said Section 7 to the Point of Beginning. Also, the East 1/2 of the following: the North 1/3 part of the Northeast 1/4 and the North 1/3 part of the East 1/2 of the Northwest 1/4, Section7, Town 7 North, Range 17 East, excepting the North 164 feet of the East 217.8 feet, and also excepting the South 200 feet of the East 387 feet except the West 177 feet of the North 70 feet.	117.99
11	74-20-005-4003-000	THE TED E. FURNESS AND CYNTHIA A. FURNESS REVOCABLE TRUST	The West Half (1/2) of the Southeast Quarter (1/4) of the Southwest Quarter (1/4) of Section 5, Town 7 North, Range 17 East, being 20 acres more or less.	20.99
12	74-20-008-1002-000	THE TED E. FURNESS AND CYNTHIA A. FURNESS REVOCABLE TRUST	The West 60 acres of the North 1/3 of the West 3/4 of the North 1/2 of Section 8, Town 7 North, Range 17 East, excepting therefrom the North 11 1/2 rods of the West 10 1/2 rods thereof and except the South 388.93 feet of the West 280 feet thereof.	54.38
13	74-20-008-2013-000	THE TED E. FURNESS AND CYNTHIA A. FURNESS REVOCABLE TRUST	The South 1/2 of the North 2/3 of the West 3/4 of the North 1/2 except the South 264.33 feet of the West 824 feet thereof and except the West 200 feet of the North 150 feet of the South 1,433.88 feet of the Northwest 1/4 of Section 8, except the following: A parcel of land in Section 8 described as: Commencing at the West quarter corner of Section 8, thence North 0 degrees 12 minutes 30 seconds West 1,144.03 feet along the West section line; thence South 89 degrees 22 minutes 00 seconds East 200.00 feet to the Point of Beginning, thence continuing South 89 degrees 22 minutes 00 seconds East 628.91 feet; thence South 264.33 feet; thence South 89 degrees 22 minutes 00 seconds East 1,234.87 feet; thence North 01 degrees 04 minutes 00 second, East 372.75 feet; thence North 88 degrees 08 minutes 30 seconds West 212.14 feet; thence North 4 degrees 16 minutes 30 seconds West 246.87 feet; thence North 89 degrees 22 minutes 00 seconds West 764.99 feet; thence South 0 degrees 12 minutes 30 seconds East 219.10 feet; thence North 89 degrees 22 minutes 00 West 876.59 feet; thence South 0 degrees 12 minutes 30 seconds East 139.85 feet to the Point of Beginning of this description.	55.66
14	74-20-008-1006-500	THE TED E. FURNESS AND CYNTHIA A. FURNESS REVOCABLE TRUST	Commencing at the West quarter corner of Section 8; thence North 0°12'30" West 1,144.03 feet along the West section line; thence South 89°22'00" East 200.00 feet to the Point of beginning; thence continuing South 89°22'00" East 628.91 feet; thence South 264.33 feet; thence South 89°22'00" East 1,234.87 feet; thence North 01°04'00" East 372.75 feet; thence North 88°08'30" West 212.14 feet; thence North 4°16'30" West 246.87 feet; thence North 89°22'00" West 764.99 feet; thence South 0°12'30" East 219.10 feet; thence North 89°22'00" West 876.59 feet; thence South 0°12'30" East 139.85 feet to the Point of the Beginning of this description. Containing 17.26 acres more or less.	19.44
15	74-20-008-1003-000	JAMES R. PALMATEER	Beginning at the West ¼ corner; thence North 00 degrees 12 minutes 30 seconds West 35 feet; thence South 89 degrees 23 minutes East 1624 feet, thence North 00 degrees 12 minutes 30 seconds West 592.35 feet; thence South 89 degrees 23 minutes East 119 feet; thence North 00 degrees 12 minutes 30 seconds West 252.35 feet; thence South 89 degrees 23 minutes East 2193.36 feet; thence South 00 degrees 2 minutes 36 seconds East 896.2 feet; thence North 89 degrees 8 minutes 33 seconds West 1312.03 feet; thence South 00 degrees I minutes 17 seconds East 1320.97 feet; thence North 89 degrees 8 minutes 32 seconds West 1303.55 feet; thence North 00 degrees 2 minutes 56 seconds East 660 feet; thence South 89 degrees 8 minutes 32 seconds East 326 feet; thence North 0 degrees 2 minutes 56 seconds East 530 feet; thence North 89 degrees 8 minutes 32 seconds West 1646 feet; thence North 00 degrees 2 minutes 56 seconds East 130.91 feet to the point of beginning. Section 8, Town 7 North Ranger 17 East, Fort Gratiot Township, St. Clair County, Michigan.	86.93
16	74-20-008-3001-000	PETERS BROTHERS LLC	The West ¼ of the Southeast ¼ of Section 8, Town 7 North, Range 17 East, Fort Gratiot Township, St. Clair County, Michigan.	78.59
17	74-20-017-2001-001	PETERS BROTHERS LLC	A parcel of land being the West 1/2 of the West 1/2 of the Northeast 1/4; The North 20 Acres of the East 1/2 of the West 1/2 of said Northeast 1/4 and part of the East 1/2 of the Northeast 1/4, all situated in Section 17, Town 7 North, Range 17 East, Fort Gratiot Township, St. Clair County, Michigan and said parcel is completely and particularly described as: Beginning at the Northeast corner of said Section 17; thence South 03 degrees 35 minutes 09 seconds East 1332.03 feet along its East line; thence South 86 degrees 43 minutes 47 seconds West 1961.34 feet; thence South 03 degrees 39 minutes 23 seconds East 1311.60 feet thence South 86 degrees 45 minutes 34 seconds West 653.24 feet to the center post of said Section 17; thence North 03 degrees 40 minutes 48 seconds West 2643.25 feet to its North 1/4 corner; thence North 86 degrees 43 minutes 42 seconds East 2617.32 feet to the Point of Beginning.	99.72

PARTICIPATING PARCEL LIST

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ATWELL
866.850.4200 www.atwell-group.com
TWO TOWNE SQUARE, SUITE 700
SOUTHFIELD, MI 48076
248.447.2000

SECTIONS: 5-8, 17
TOWN, RANGE: T07N, R17E
FORT GRATIOT TOWNSHIP
ST. CLAIR COUNTY, MICHIGAN

CLIENT: PORTSIDE SOLAR, LLC
PROJECT: PORTSIDE SOLAR - SPECIAL LAND USE PERMIT - SITE PLANS

ZONING MAP & PARTICIPATING PARCEL LIST

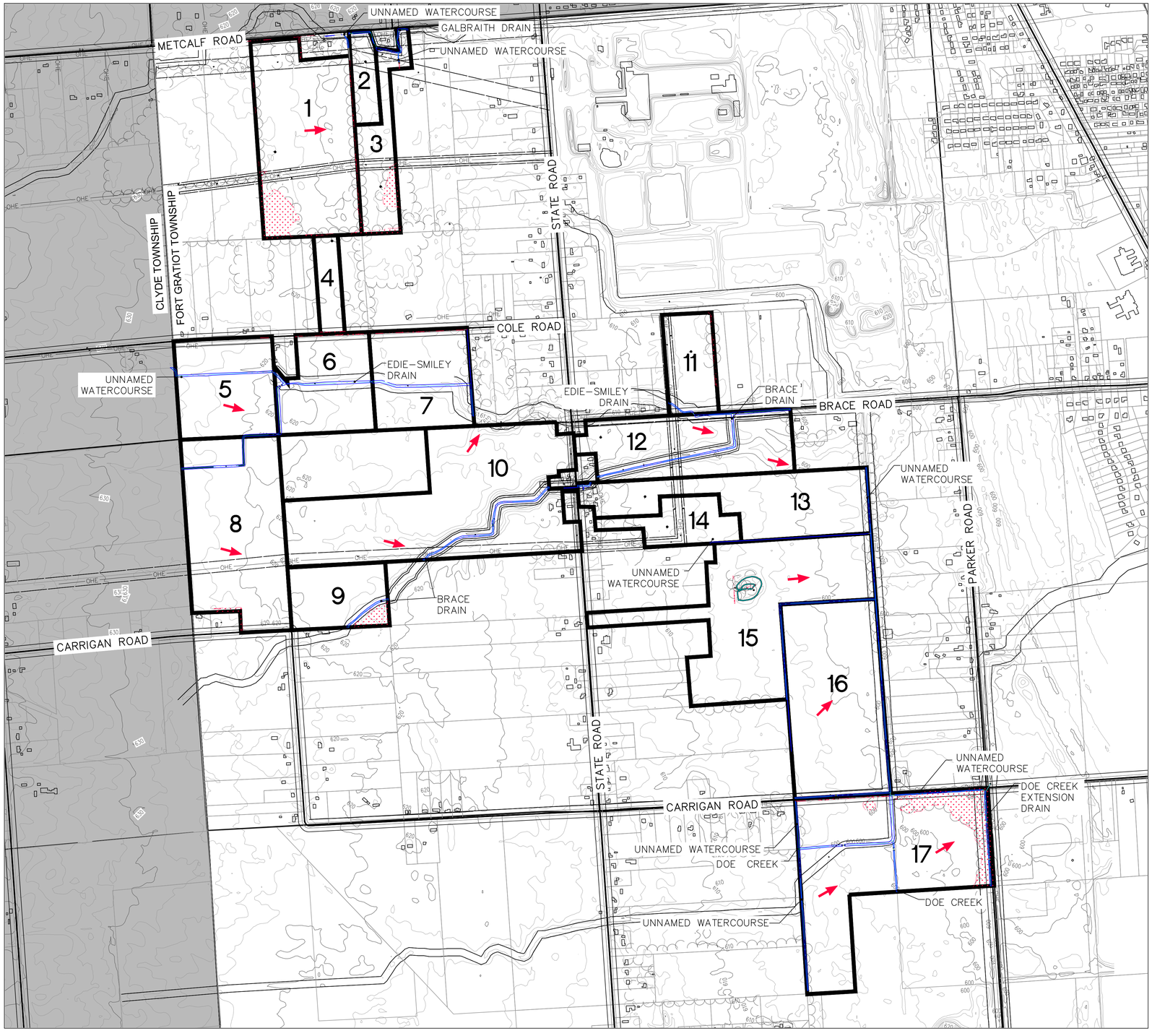
DATE: OCTOBER 6, 2023

REVISIONS

DR.	MB	CH.	ES
P.M.	ES		
BOOK	--		
JOB	22005894		
SHEET NO.	02		

CAD FILE: FORT GRATIOT-01-CV.DWG

PRELIMINARY PLANS - NOT FOR CONSTRUCTION



LEGEND

- EXIST. TREE LINE
- EXIST. WATERCOURSE TOB
- EXIST. WATERCOURSE CENTERLINE
- EXIST. WETLAND (EGLE REGULATED)
- EXIST. EASEMENT (DRAIN/UTILITY)
- EXIST. ROAD R.O.W.
- EXIST. ROAD CENTERLINE
- EXIST. SECTION / QUARTER SECTION
- EXIST. TOWNSHIP BOUNDARY
- NON-PARTICIPATING PARCEL BOUNDARY
- PARTICIPATING PARCEL BOUNDARY
- EXIST. OVERHEAD ELECTRICAL
- EXIST. STRUCTURE
- EXIST. CULVERT
- EXIST. CONTOUR MINOR
- EXIST. CONTOUR MAJOR
- FLOW ARROWS
- 16 PARCEL ID (SEE SHEET 02)

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CLIENT: PORTSIDE SOLAR, LLC
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SPECIAL LAND USE PERMIT - SITE PLANS

EXISTING CONDITIONS - OVERALL

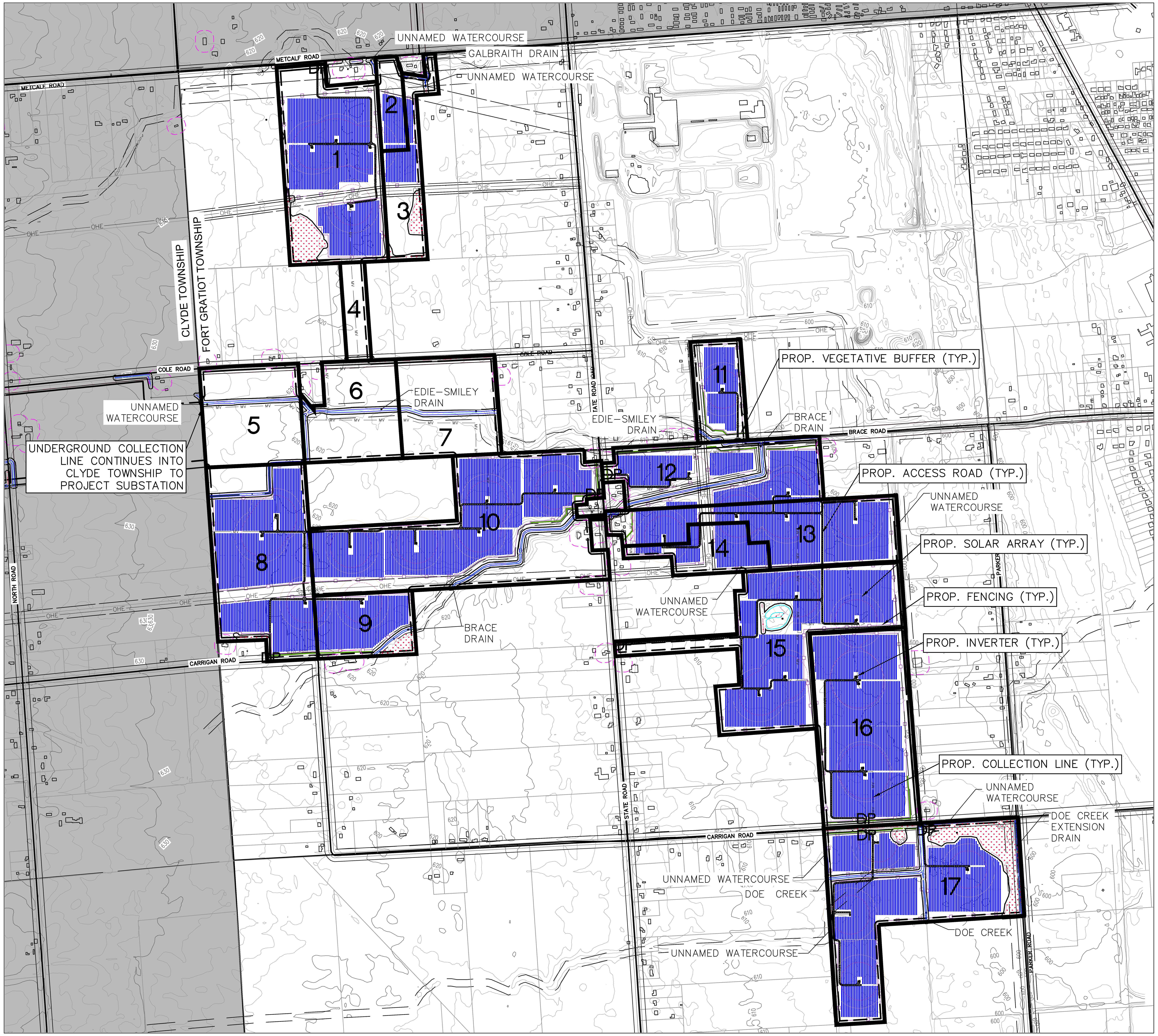
DATE 8/17/2023

REVISIONS

SCALE 0 350 700
1" = 700 FEET

DR. MB	CH. ES
P.M. ES	
BOOK --	
JOB 22005894	
SHEET NO. 03	

PRELIMINARY PLANS - NOT FOR CONSTRUCTION



NOTES

1. SEE SHEET 17 FOR ADDITIONAL NOTES.
2. EXISTING CONTOURS ARE BASED ON PUBLICLY AVAILABLE LIDAR DATA AND ARE PROVIDED FOR PRELIMINARY DESIGN AND REVIEW ONLY – NOT TO BE USED FOR CONSTRUCTION.
3. LOCALIZED GRADING WILL BE NECESSARY TO MEET TRACKER VENDOR TOLERANCES AND FOR MAINTAINING DRAINAGE. THE EPC WILL BE RESPONSIBLE FOR DEVELOPING A FINAL GRADING AND SOIL EROSION CONTROL PLAN UPON FINAL ELECTRICAL AND TRACKER DESIGN.
4. PROPOSED ROADS ARE INTENDED TO GENERALLY MATCH EXISTING GRADE AND SHALL BE GRADED TO NOT IMPEDE THE FLOW OF RUNOFF TO DOWNSTREAM AREAS.
5. CULVERTS TO BE PROVIDED AT PROPOSED DRIVEWAYS WHERE NECESSARY BASED ON PRESENCE OF ROADSIDE DRAINAGE DITCH AND APPROVAL FROM THE COUNTY.
6. PARCEL BOUNDARY LABELS ARE BASED ON COUNTY GIS LINEWORK AND SUBJECT TO CONFIRMATION/ADJUSTMENT BASED ON FIELD BOUNDARY SURVEYS PRIOR TO CONSTRUCTION.

LEGEND

EXIST. TREE LINE
EXIST. WATERCOURSE TOB
EXIST. WATERCOURSE CENTERLINE
EXIST. WETLAND (EGLE REGULATED)
EXIST. EASEMENT (UTILITY/DRAIN)
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OHE — EXIST. OVERHEAD ELECTRICAL
EXIST. STRUCTURE
EXIST. CULVERT
EXIST. CONTOUR MINOR
EXIST. CONTOUR MAJOR
MV — PROP. UNDERGROUND COLLECTION
PROP. SOLAR ARRAY
PROP. FENCE
PROP. GRAVEL ACCESS DRIVE
PROP. INVERTOR
PROP. VEGETATION BUFFER (SCREENING)
DP — DRIVEWAY PERMIT REQUIRED FROM ST. CLAIR COUNTY
45 DBA SOUND LEVEL BANDS
16 — PARCEL ID (SEE SHEET 02)

SETBACK TABLE	
25' EGLE SETBACKS	
50' NON-PARTICIPATING PARCEL SETBACKS	
50' ROW SETBACKS	
100' RESIDENCE SETBACKS	
350' INVERTER SETBACKS	

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REVISIONS

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SHEET NO. 04

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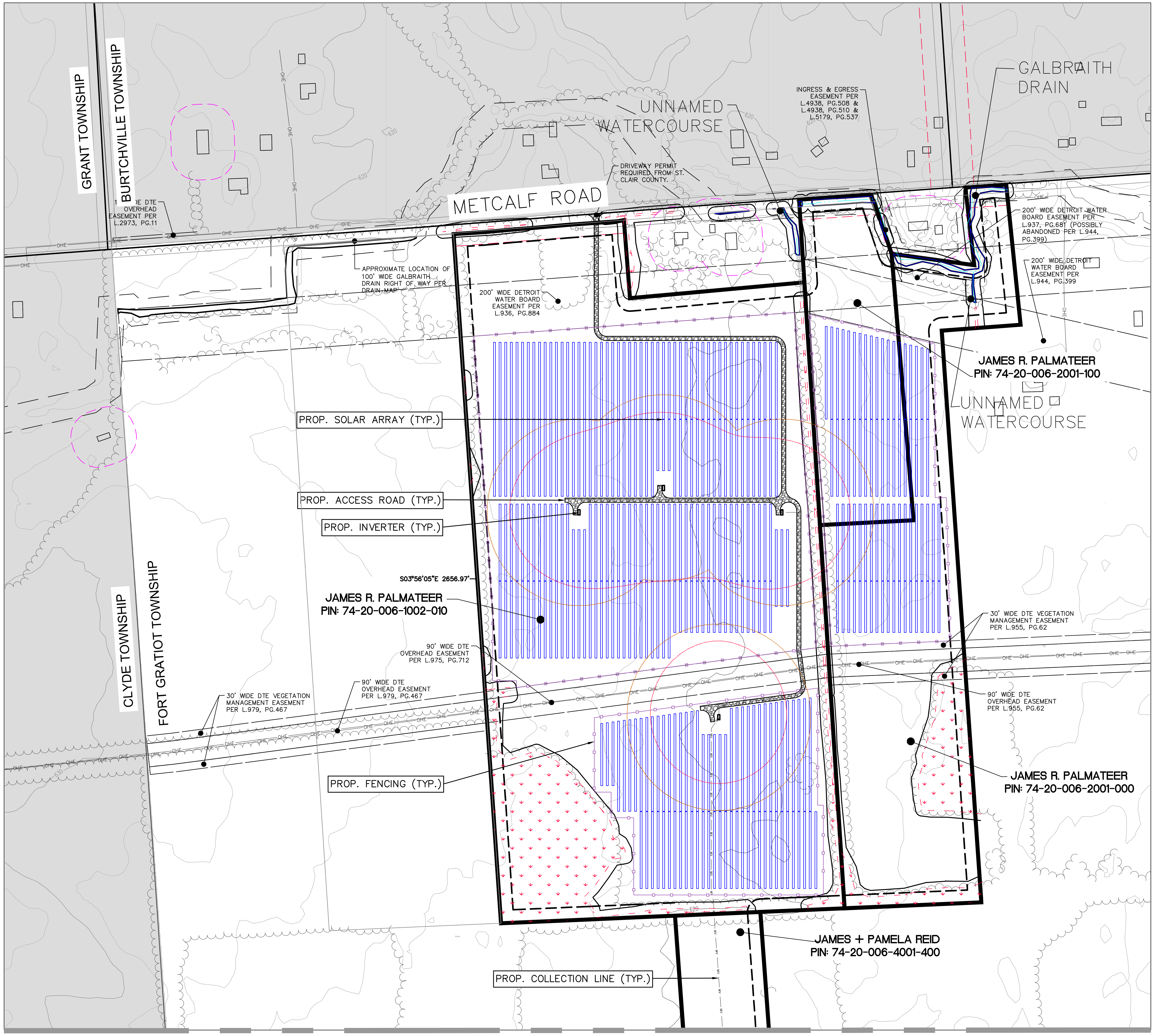
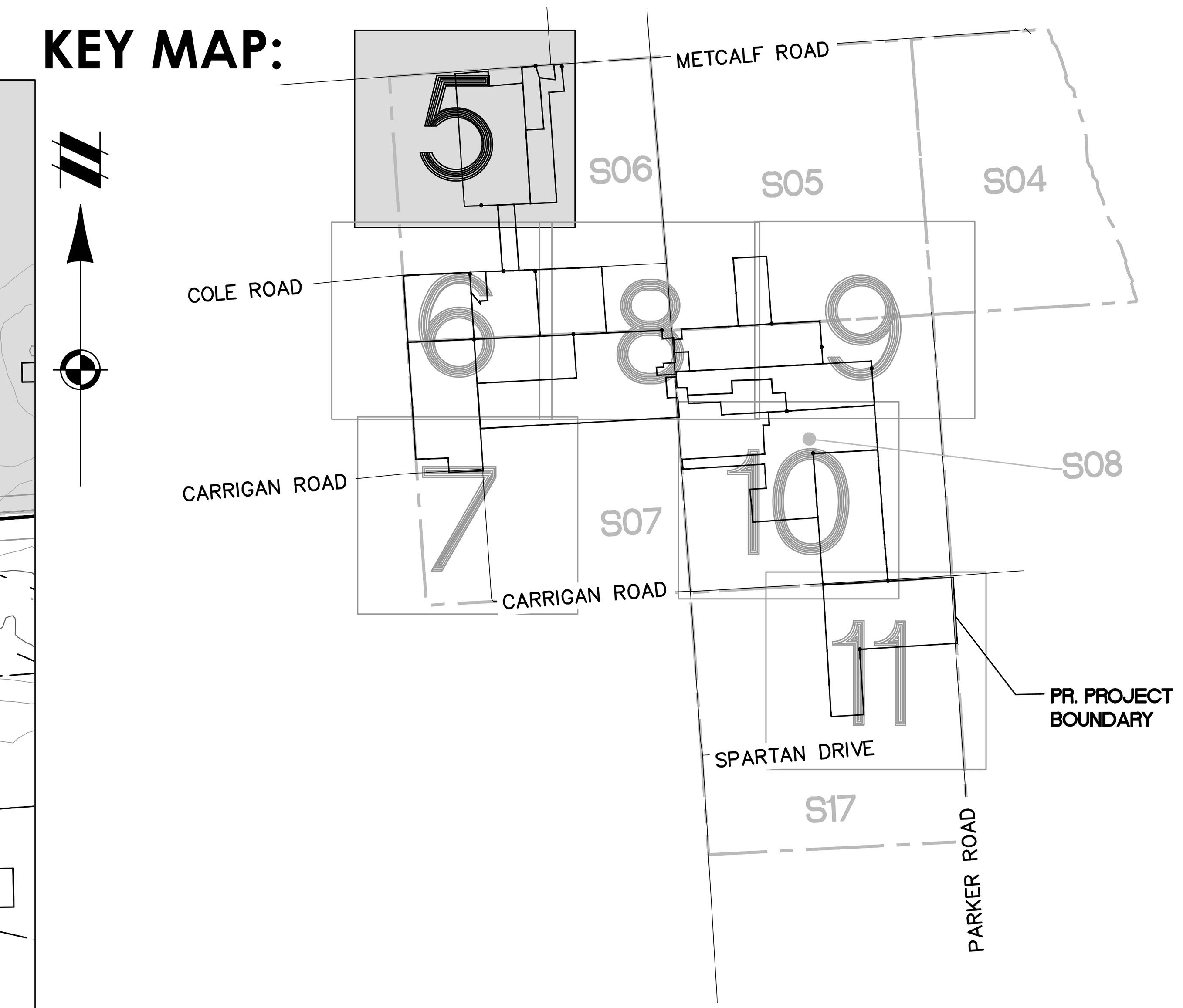


MATCHLINE-01 (SEE SHEET 06)

KEY MAP:



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- EXIST. CONTOUR MAJOR
- PROP. UNDERGROUND COLLECTION
- PROP. SOLAR ARRAY
- PROP. FENCE
- PROP. GRAVEL ACCESS DRIVE
- PROP. INVERTOR
- PROP. VEGETATION BUFFER
- 45 DBH SOUND LEVEL BAND

SETBACK TABLE	
25' EGLE SETBACKS	
50' NON-PARTICIPATING PARCEL SETBACKS	
50' ROW SETBACKS	
100' RESIDENCE SETBACKS	
350' INVERTER SETBACKS	

NOTES

1. SEE SHEET 04 & 17 FOR GENERAL NOTES.

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PROPOSED CONDITIONS - 5

DATE: 8/17/2023

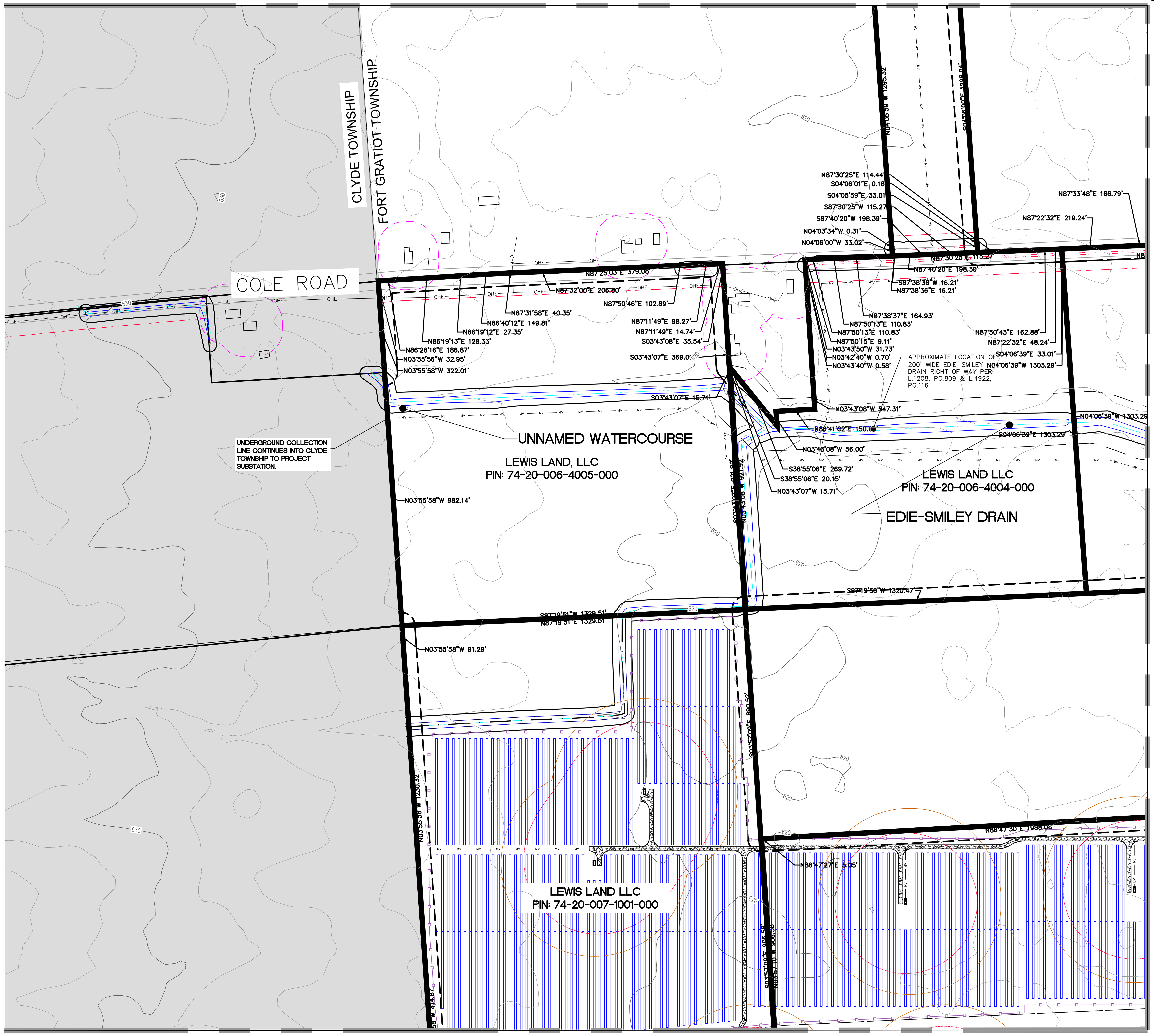
REVISIONS

SCALE 0 100 200
1" = 200 FEET

DR. MB | CH. ES
P.M. ES
BOOK --
JOB 22005894
SHEET NO. 05

PRELIMINARY PLANS - NOT FOR CONSTRUCTION

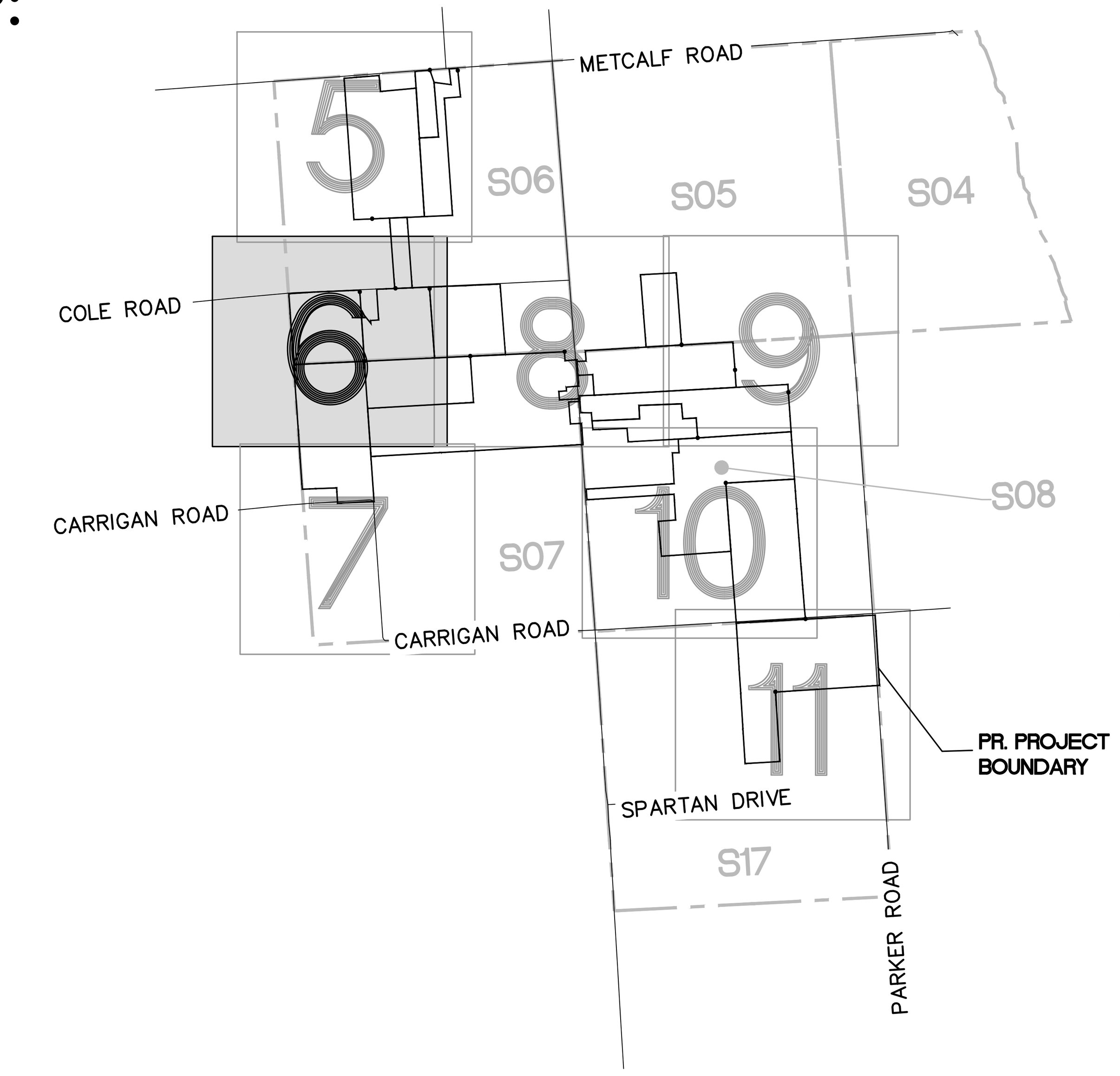
MATCHLINE-01 (SEE SHEET 05)



MATCHLINE-03 (SEE SHEET 08)

MATCHLINE-02 (SEE SHEET 07)

KEY MAP:



LEGEND

	EXIST. TREE LINE
	EXIST. WATERCOURSE TOB
	EXIST. WATERCOURSE CENTERLINE
	EXIST. WETLAND (EGLE REGULATED)
	EXIST. EASEMENT (UTILITY/DRAIN)
	EXIST. ROAD R.O.W.
	EXIST. ROAD CENTERLINE
	EXIST. SECTION / QUARTER SECTION
	EXIST. TOWNSHIP BOUNDARY
	NON-PARTICIPATING PARCEL BOUNDARY
	PARTICIPATING PARCEL BOUNDARY
OHE	EXIST. OVERHEAD ELECTRICAL
	EXIST. STRUCTURE
	EXIST. CULVERT
	EXIST. CONTOUR MINOR
	EXIST. CONTOUR MAJOR
MV	PROP. UNDERGROUND COLLECTION
	PROP. SOLAR ARRAY
	PROP. FENCE
	PROP. GRAVEL ACCESS DRIVE
	PROP. INVERTOR
	PROP. VEGETATION BUFFER
	45 DBH SOUND LEVEL BAND

SETBACK TABLE	
25' EGLE SETBACKS	
50' NON-PARTICIPATING PARCEL SETBACKS	
50' ROW SETBACKS	
100' RESIDENCE SETBACKS	
350' INVERTER SETBACKS	

NOTES

1. SEE SHEET 04 & 17 FOR GENERAL NOTES.

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SOUTHFIELD, MI 48076
248.447.2000

SECTIONS: 5-8, 17
TOWN, RANGE: T07N, R17E
FORT GRATIOT TOWNSHIP
ST. CLAIR COUNTY, MICHIGAN

CLIENT: PORTSIDE SOLAR, LLC
PROJECT: PORTSIDE SOLAR
SPECIAL LAND USE PERMIT - SITE PLANS
PROPOSED CONDITIONS - 6

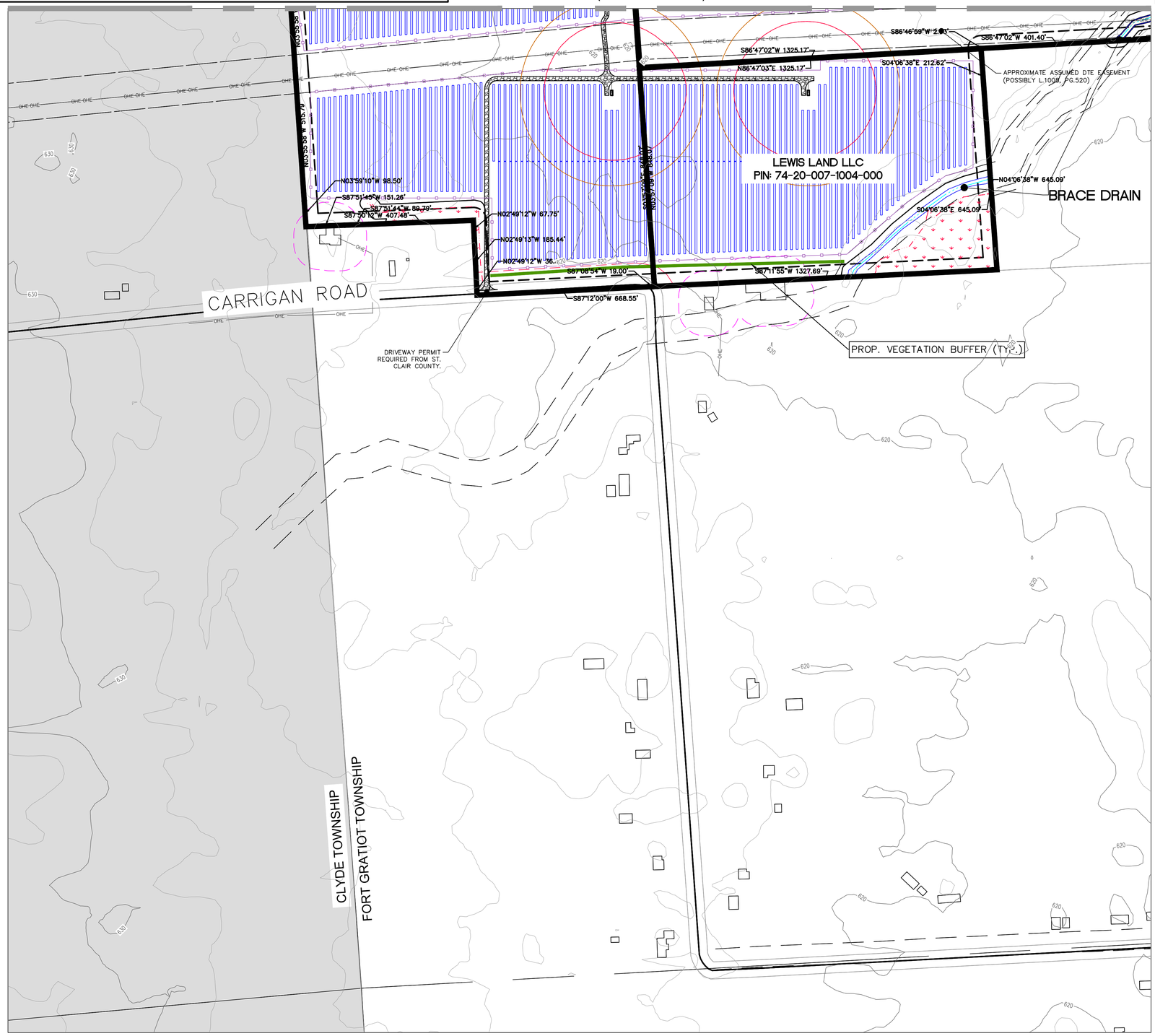
DATE: 8/17/2023

REVISIONS

SCALE 0 100 200
1" = 200 FEET
DR. MB CH. ES
P.M. ES
BOOK --
JOB 22005894
SHEET NO. 06

PRELIMINARY PLANS - NOT FOR CONSTRUCTION

MATCHLINE-03 (SEE SHEET 06)



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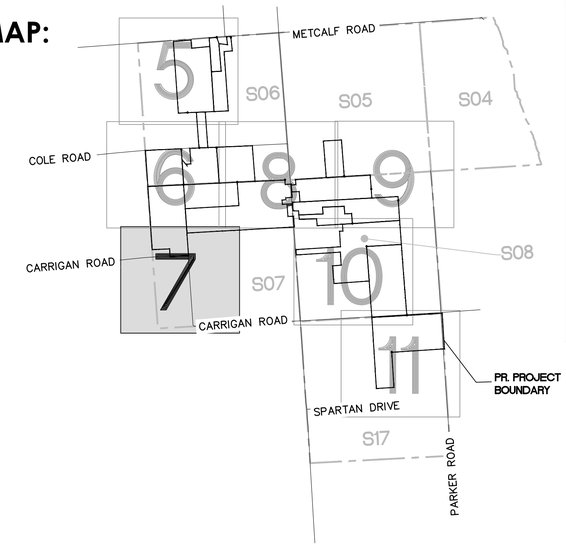

LEGEND

- EXIST. TREE LINE
- EXIST. WATERCOURSE TOB
- EXIST. WATERCOURSE CENTERLINE
- EXIST. WETLAND (EGLE REGULATED)
- EXIST. EASEMENT (UTILITY/DRAIN)
- EXIST. ROAD R.O.W.
- EXIST. ROAD CENTERLINE
- EXIST. SECTION / QUARTER SECTION
- EXIST. TOWNSHIP BOUNDARY
- NON-PARTICIPATING PARCEL BOUNDARY
- PARTICIPATING PARCEL BOUNDARY
- OHE — EXIST. OVERHEAD ELECTRICAL
- EXIST. STRUCTURE
- EXIST. CULVERT
- EXIST. CONTOUR MINOR
- EXIST. CONTOUR MAJOR
- MV — PROP. UNDERGROUND COLLECTION
- PROP. SOLAR ARRAY
- PROP. FENCE
- PROP. GRAVEL ACCESS DRIVE
- PROP. INVERTOR
- PROP. VEGETATION BUFFER
- 45 DBH SOUND LEVEL BAND

SETBACK TABLE	
25' EGLE SETBACKS	
50' NON-PARTICIPATING PARCEL SETBACKS	
50' ROW SETBACKS	
100' RESIDENCE SETBACKS	
350' INVERTER SETBACKS	

NOTES

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SECTIONS: 5-8, 17
TOWN, RANGE: T07N, R17E
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ST. CLAIR COUNTY, MICHIGAN

CLIENT: PORTSIDE SOLAR, LLC
PROJECT: PORTSIDE SOLAR
SPECIAL LAND USE PERMIT - SITE PLANS

PROPOSED CONDITIONS - 7

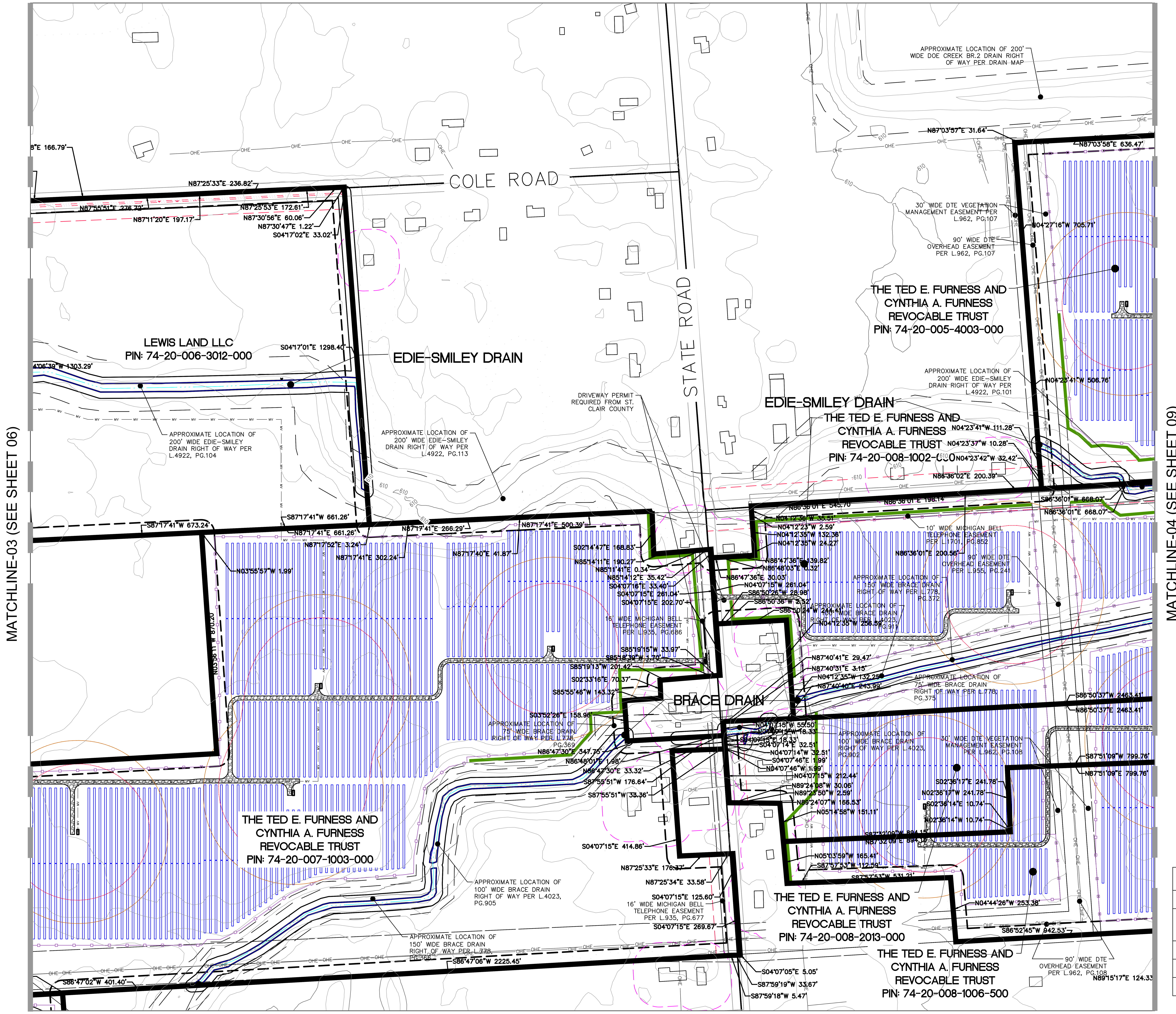
DATE: 8/17/2023

REVISIONS

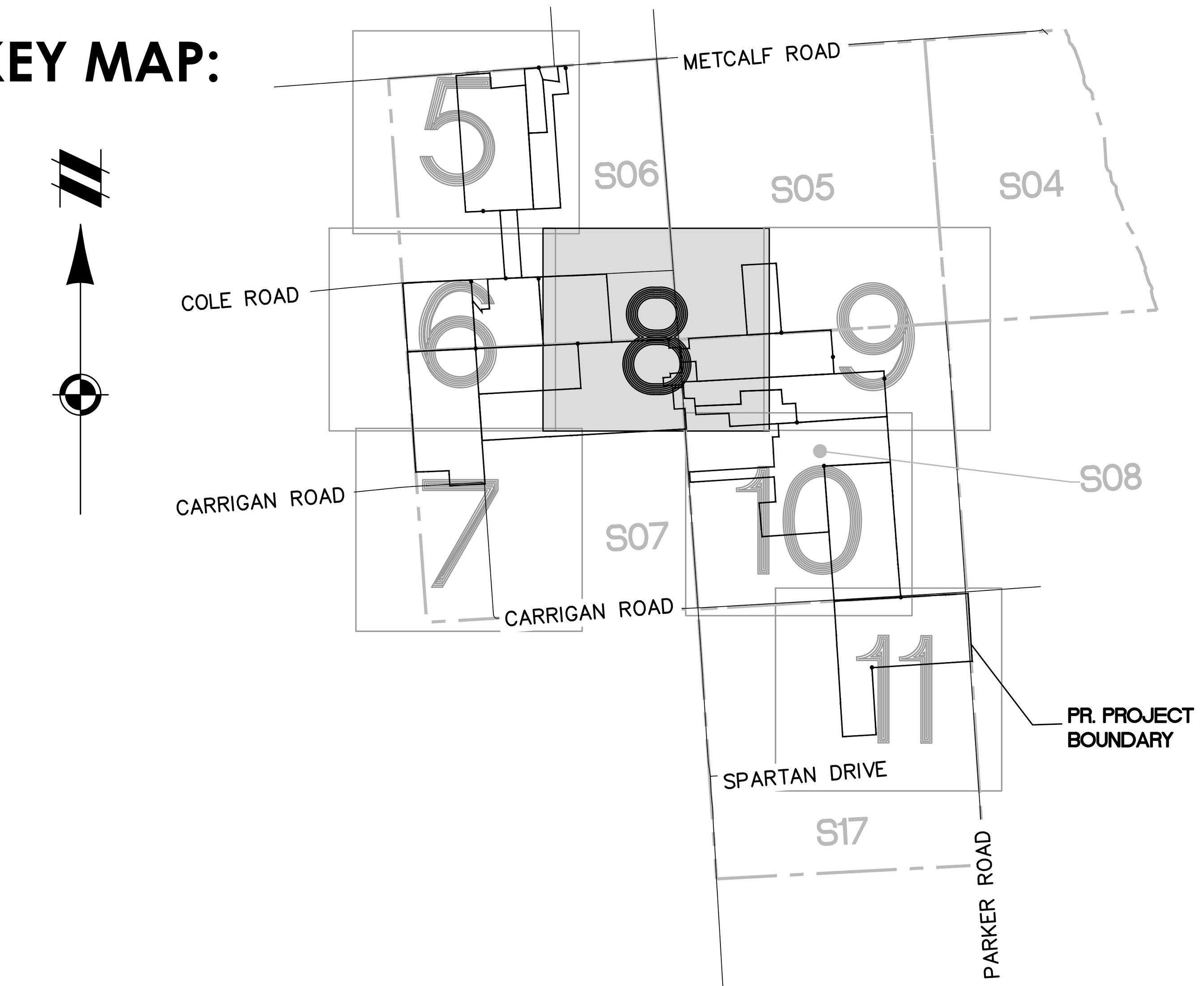
SCALE 0 100 200
1" = 200 FEET

DR. MB	CH. ES
P.M. ES	
BOOK --	
JOB 22005894	
SHEET NO. 07	

PRELIMINARY PLANS - NOT FOR CONSTRUCTION



KEY MAP:



LEGEND

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- EXIST. WATERCOURSE TOB
- EXIST. WATERCOURSE CENTERLINE
- EXIST. WETLAND (EGLE REGULATED)
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- PARTICIPATING PARCEL BOUNDARY
- EXIST. OVERHEAD ELECTRICAL
- EXIST. STRUCTURE
- EXIST. CULVERT
- EXIST. CONTOUR MINOR
- EXIST. CONTOUR MAJOR
- PROP. UNDERGROUND COLLECTION
- PROP. SOLAR ARRAY
- PROP. FENCE
- PROP. GRAVEL ACCESS DRIVE
- PROP. INVERTOR
- PROP. VEGETATION BUFFER
- 45 DBH SOUND LEVEL BAND

SETBACK TABLE	
25' EGLE SETBACKS	
50' NON-PARTICIPATING PARCEL SETBACKS	
50' ROW SETBACKS	
100' RESIDENCE SETBACKS	
350' INVERTER SETBACKS	

NOTES

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SECTIONS: 5-8, 17
TOWN, RANGE: T07N, R17E
FORT GRATIOT TOWNSHIP
ST. CLAIR COUNTY, MICHIGAN

CLIENT: PORTSIDE SOLAR, LLC

PROJECT: PORTSIDE SOLAR
SPECIAL LAND USE PERMIT - SITE PLANS

PROPOSED CONDITIONS - 8

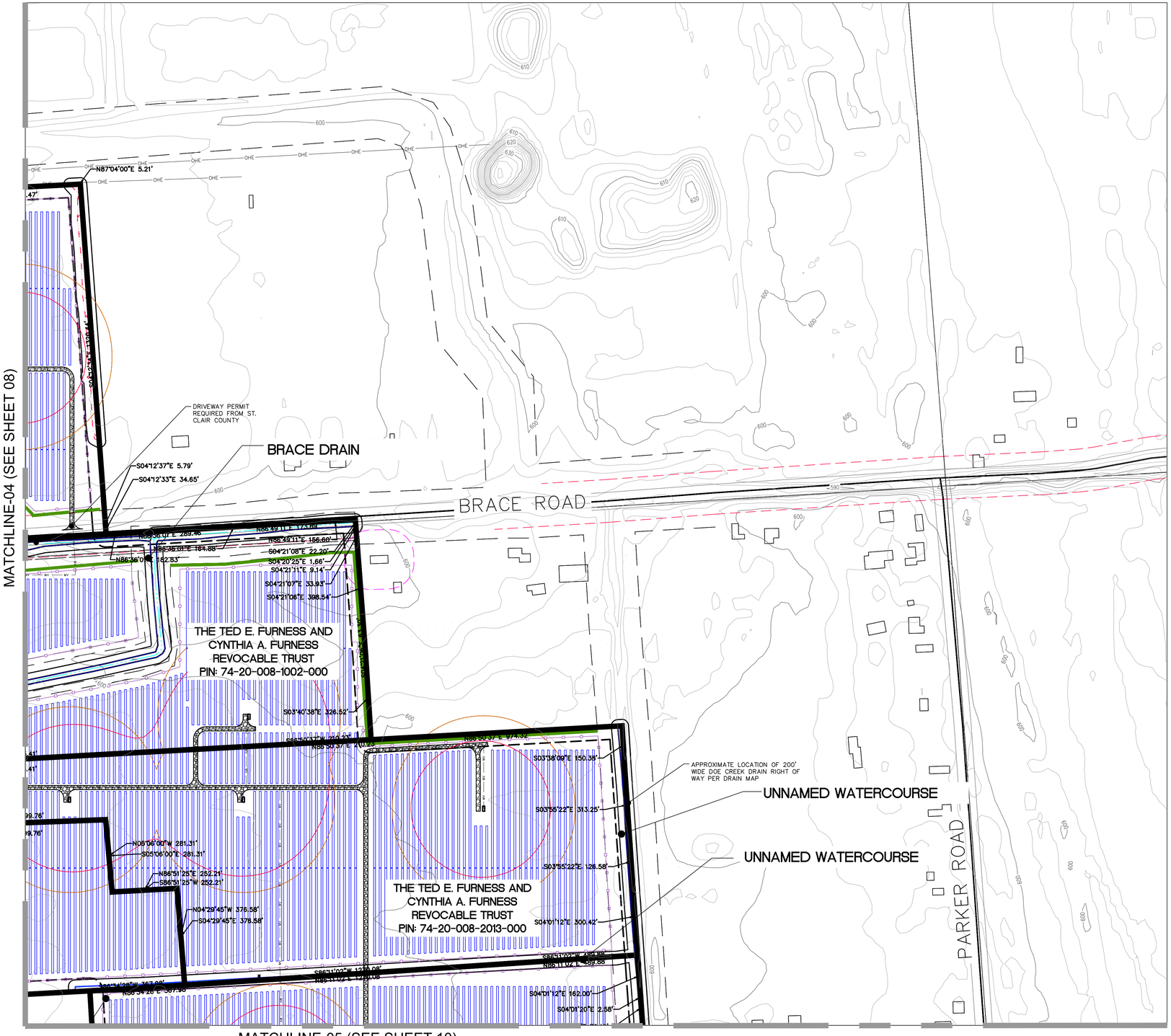
DATE: 8/17/2023

REVISIONS

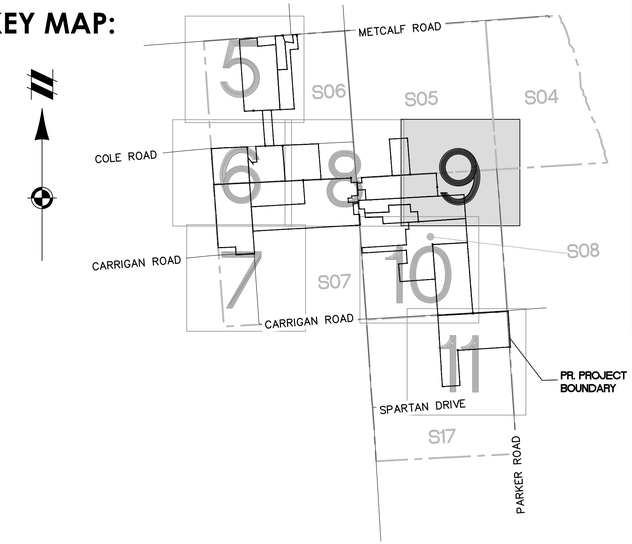
SCALE 0 100 200
1" = 200 FEET

DR. MB | CH. ES
P.M. ES
BOOK --
JOB 22005894
SHEET NO. 08

PRELIMINARY PLANS - NOT FOR CONSTRUCTION



KEY MAP:



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- PARTICIPATING PARCEL BOUNDARY
- EXIST. OVERHEAD ELECTRICAL
- EXIST. STRUCTURE
- EXIST. CULVERT
- EXIST. CONTOUR MINOR
- EXIST. CONTOUR MAJOR
- PROP. UNDERGROUND COLLECTION
- PROP. SOLAR ARRAY
- PROP. FENCE
- PROP. GRAVEL ACCESS DRIVE
- PROP. INVERTOR
- PROP. VEGETATION BUFFER
- 45 DBH SOUND LEVEL BAND

SETBACK TABLE	
25' EGLE SETBACKS	———
50' NON-PARTICIPATING PARCEL SETBACKS	- - - - - - - - - -
50' ROW SETBACKS	- - - - - - - - - -
100' RESIDENCE SETBACKS	- - - - - - - - - -
350' INVERTER SETBACKS	———

NOTES

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SECTIONS: 5-8, 17
TOWN, RANGE: T07N, R17E
FORT GRATIOT TOWNSHIP
ST. CLAIR COUNTY, MICHIGAN

CLIENT: PORTSIDE SOLAR, LLC
PROJECT: PORTSIDE SOLAR – SPECIAL LAND USE PERMIT – SITE PLANS

PROPOSED CONDITIONS – 9

DATE: 8/17/2023

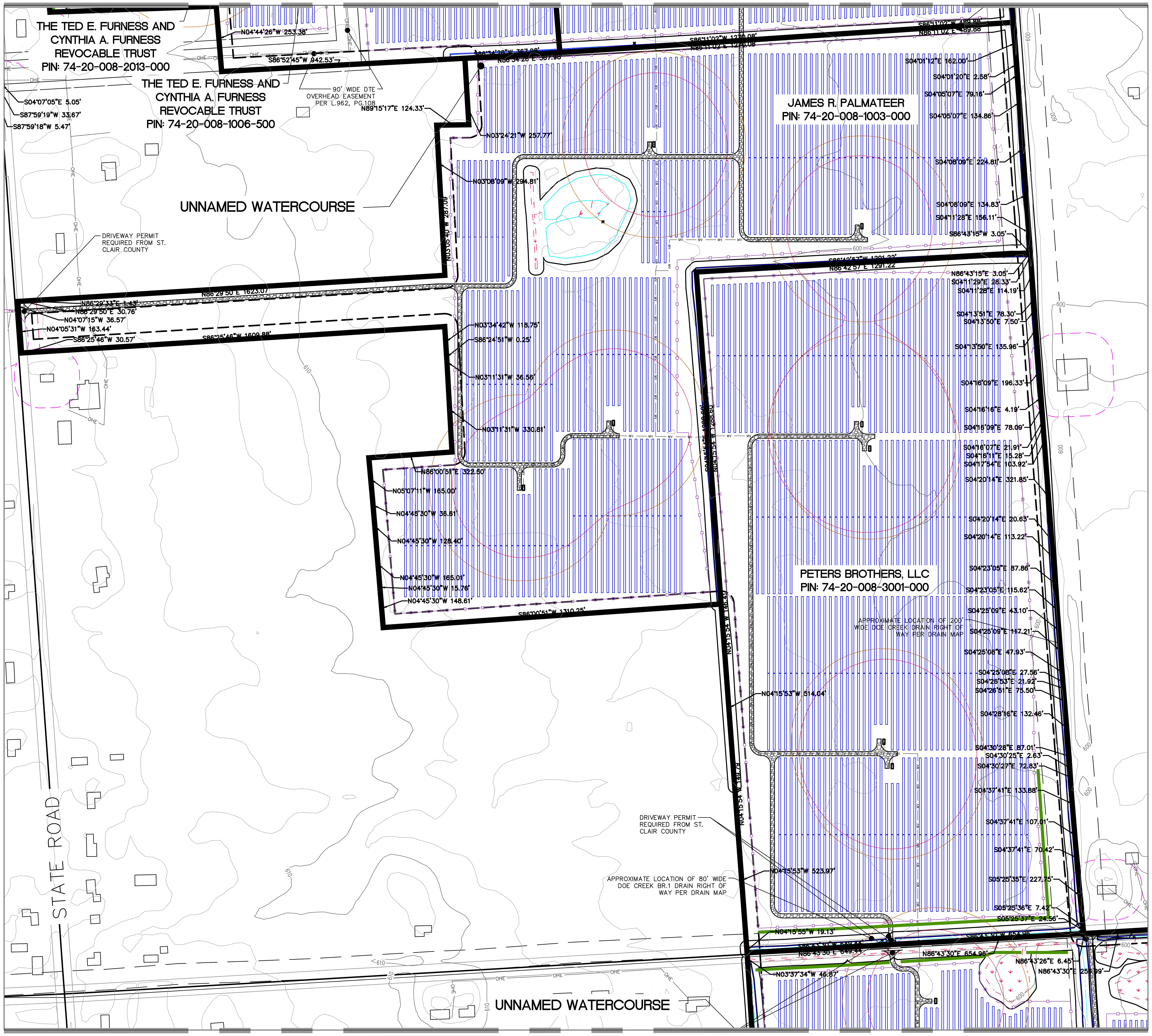
REVISIONS

SCALE 0 100 200
1" = 200 FEET

DR. MB	CH. ES
P.M. ES	
BOOK --	
JOB 22005894	
SHEET NO. 09	

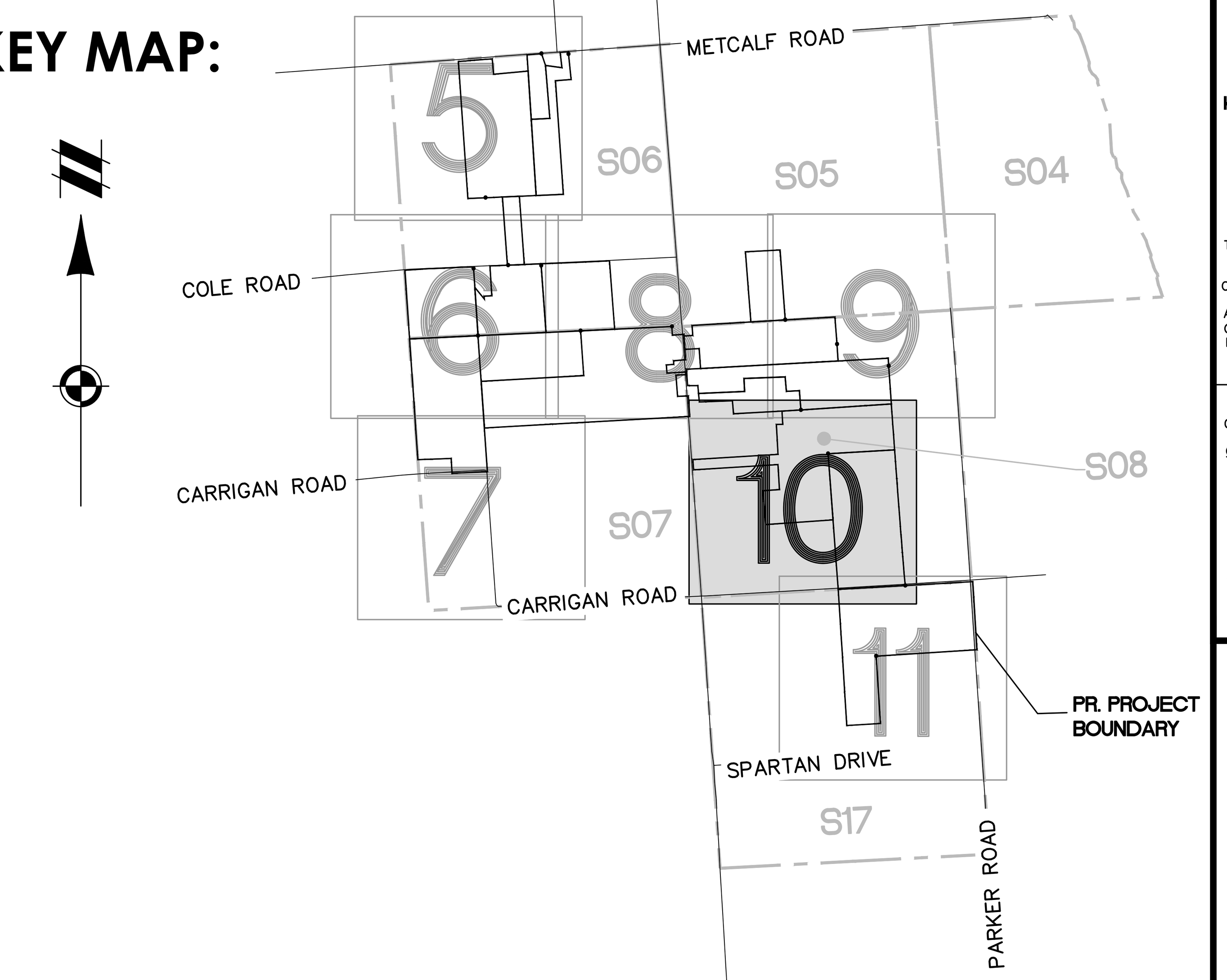
PRELIMINARY PLANS - NOT FOR CONSTRUCTION

MATCHLINE-05 (SEE SHEET 09)



MATCHLINE-06 (SEE SHEET 11)

KEY MAP:



LEGEND

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- PARTICIPATING PARCEL BOUNDARY
- EXIST. OVERHEAD ELECTRICAL
- EXIST. STRUCTURE
- EXIST. CULVERT
- EXIST. CONTOUR MINOR
- EXIST. CONTOUR MAJOR
- PROP. UNDERGROUND COLLECTION
- PROP. SOLAR ARRAY
- PROP. FENCE
- PROP. GRAVEL ACCESS DRIVE
- PROP. INVERTOR
- PROP. VEGETATION BUFFER
- 45 DBH SOUND LEVEL BAND

SETBACK TABLE	
25' EGLE SETBACKS	
50' NON-PARTICIPATING PARCEL SETBACKS	
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350' INVERTER SETBACKS	

NOTES

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SECTIONS: 5–8, 17
TOWN, RANGE: T07N, R17E
FORT GRATIOT TOWNSHIP
ST. CLAIR COUNTY, MICHIGAN

CLIENT: PORTSIDE SOLAR, LLC
PROJECT: PORTSIDE SOLAR
SPECIAL LAND USE PERMIT – SITE PLANS
PROPOSED CONDITIONS

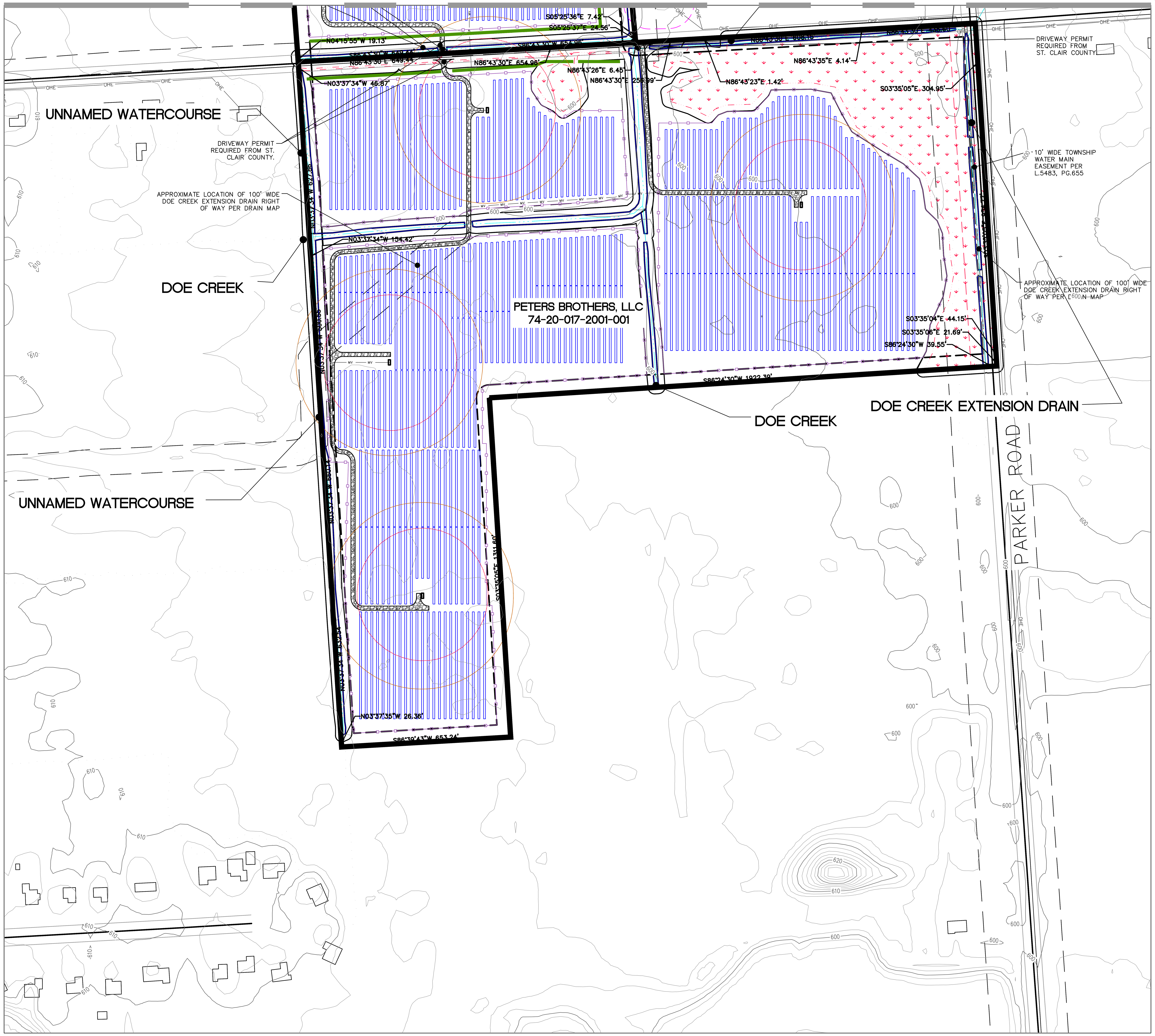
DATE: 8/17/2023

REVISIONS

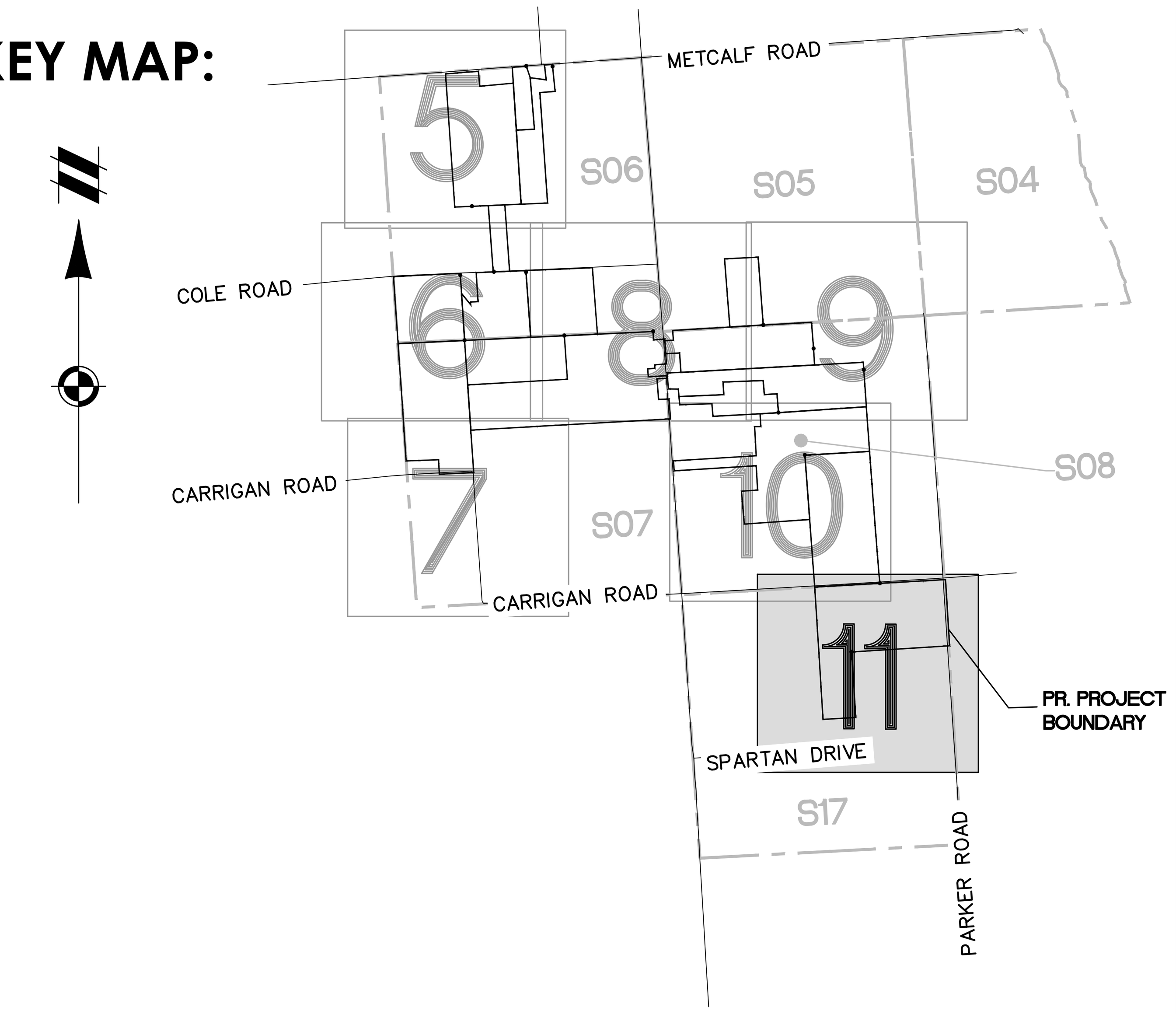
SCALE 0 100 200
1" = 200 FEET
DR. MB | CH. ES
P.M. ES
BOOK --
JOB 22005894
SHEET NO. 10

PRELIMINARY PLANS - NOT FOR CONSTRUCTION

MATCHLINE-06 (SEE SHEET 10)



KEY MAP:



LEGEND

- EXIST. TREE LINE
- EXIST. WATERCOURSE TOB
- EXIST. WATERCOURSE CENTERLINE
- EXIST. WETLAND (EGLE REGULATED)
- EXIST. EASEMENT (UTILITY/DRAIN)
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- EXIST. ROAD CENTERLINE
- EXIST. SECTION / QUARTER SECTION
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- PARTICIPATING PARCEL BOUNDARY
- EXIST. OVERHEAD ELECTRICAL
- EXIST. STRUCTURE
- EXIST. CULVERT
- EXIST. CONTOUR MINOR
- EXIST. CONTOUR MAJOR
- PROP. UNDERGROUND COLLECTION
- PROP. SOLAR ARRAY
- PROP. FENCE
- PROP. GRAVEL ACCESS DRIVE
- PROP. INVERTOR
- PROP. VEGETATION BUFFER
- 45 DBH SOUND LEVEL BAND

SETBACK TABLE
25' EGLE SETBACKS
50' NON-PARTICIPATING PARCEL SETBACKS
50' ROW SETBACKS
100' RESIDENCE SETBACKS
350' INVERTER SETBACKS

NOTES

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SECTIONS: 5-8, 17
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FORT GRATIOT TOWNSHIP
ST. CLAIR COUNTY, MICHIGAN

CLIENT: **PORTSIDE SOLAR, LLC**

PROJECT: **PORTSIDE SOLAR**
SPECIAL LAND USE PERMIT - SITE PLANS

PROPOSED CONDITIONS - 11

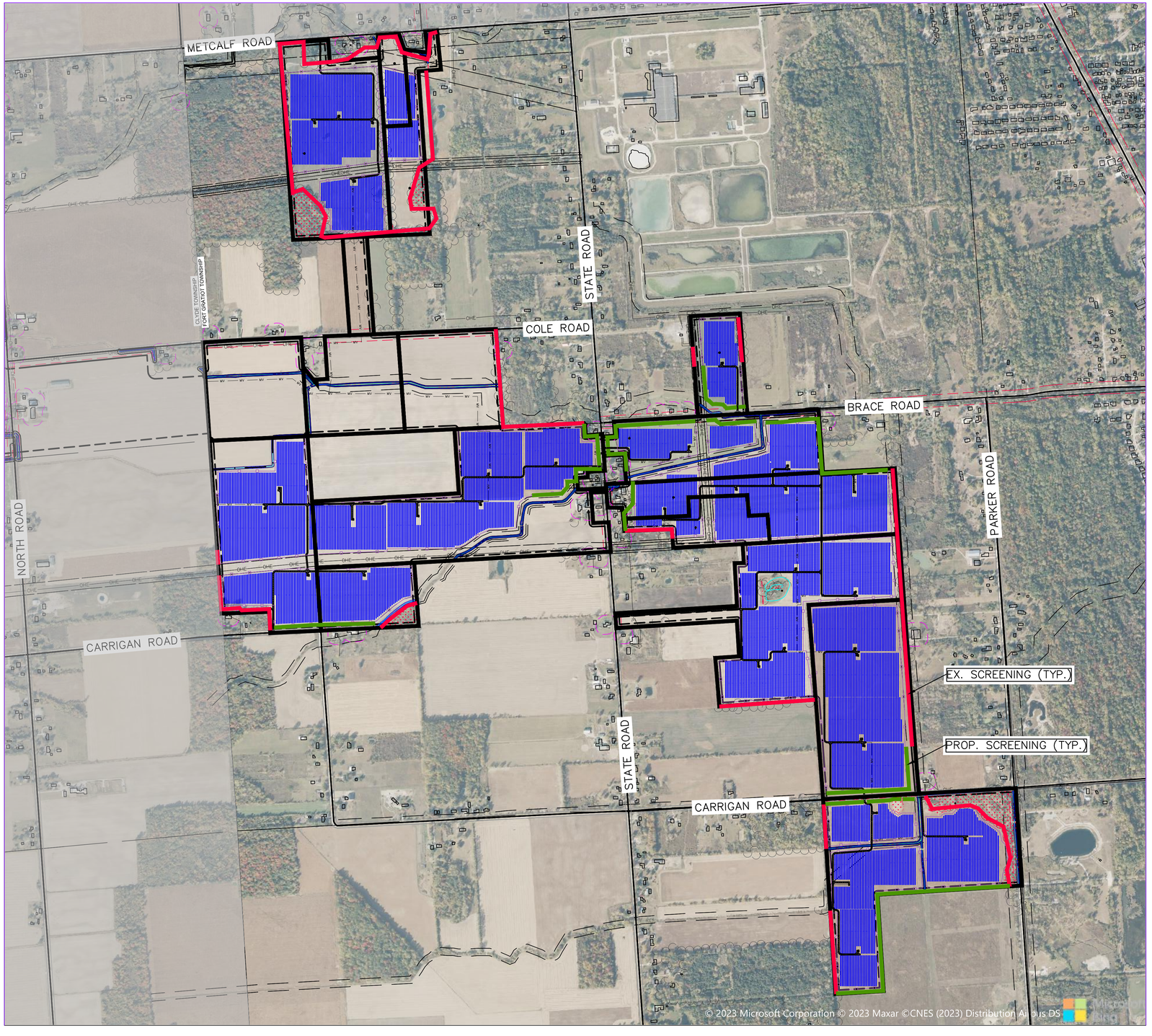
DATE 8/17/2023

REVISIONS

SCALE 0 100 200
1" = 200 FEET

DR. MB	CH. ES
P.M. ES	
BOOK --	
JOB 22005894	
SHEET NO. 11	

PRELIMINARY PLANS - NOT FOR CONSTRUCTION



GENERAL NOTES:

1. VEGETATIVE SCREENING PROPOSED ALONG ALL NON-PARTICIPATING RESIDENTIAL AND PUBLIC USES WHERE EXISTING SCREENING IS NOT ADEQUATE.
2. ALL PROPOSED SCREENING PLACED OUTSIDE THE PERIMETER FENCING.
3. APPROXIMATELY 13,970 LINEAR FEET OF VEGETATIVE SCREENING IS PROPOSED FOR THE PROJECT WITHIN FORT GRATIOT TOWNSHIP.
4. REFER TO SHEET 16 FOR SCREENING/PLANTING DETAILS.

LEGEND

- EXIST. FOREST LINE
- EXIST. WATERCOURSE TOB
- EXIST. WATERCOURSE CENTERLINE
- EXIST. WETLAND (EGLE REGULATED)
- EXIST. WETLAND (NON-REGULATED)
- EXIST. EASEMENT
- EXIST. ROAD R.O.W.
- EXIST. ROAD CENTERLINE
- EXIST. SECTION / QUARTER SECTION
- EXIST. TOWNSHIP BOUNDARY
- NON-PARTICIPATING PARCEL BOUNDARY
- PARTICIPATING PARCEL BOUNDARY
- EXIST. OVERHEAD ELECTRICAL
- EXIST. STRUCTURE
- EXIST. STORM SEWER
- EXIST. VEGETATION (SCREENING)
- PROP. UNDERGROUND COLLECTION
- PROP. SOLAR ARRAY
- PROP. FENCE
- PROP. GRAVEL ACCESS DRIVE
- PROP. INVERTOR
- PROP. VEGETATION BUFFER (SCREENING)

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SECTIONS: 5-8, 17
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FORT GRATIOT TOWNSHIP
ST. CLAIR COUNTY, MICHIGAN

CLIENT: PORTSIDE SOLAR, LLC
PROJECT: PORTSIDE SOLAR – SPECIAL LAND USE PERMIT – SITE PLANS

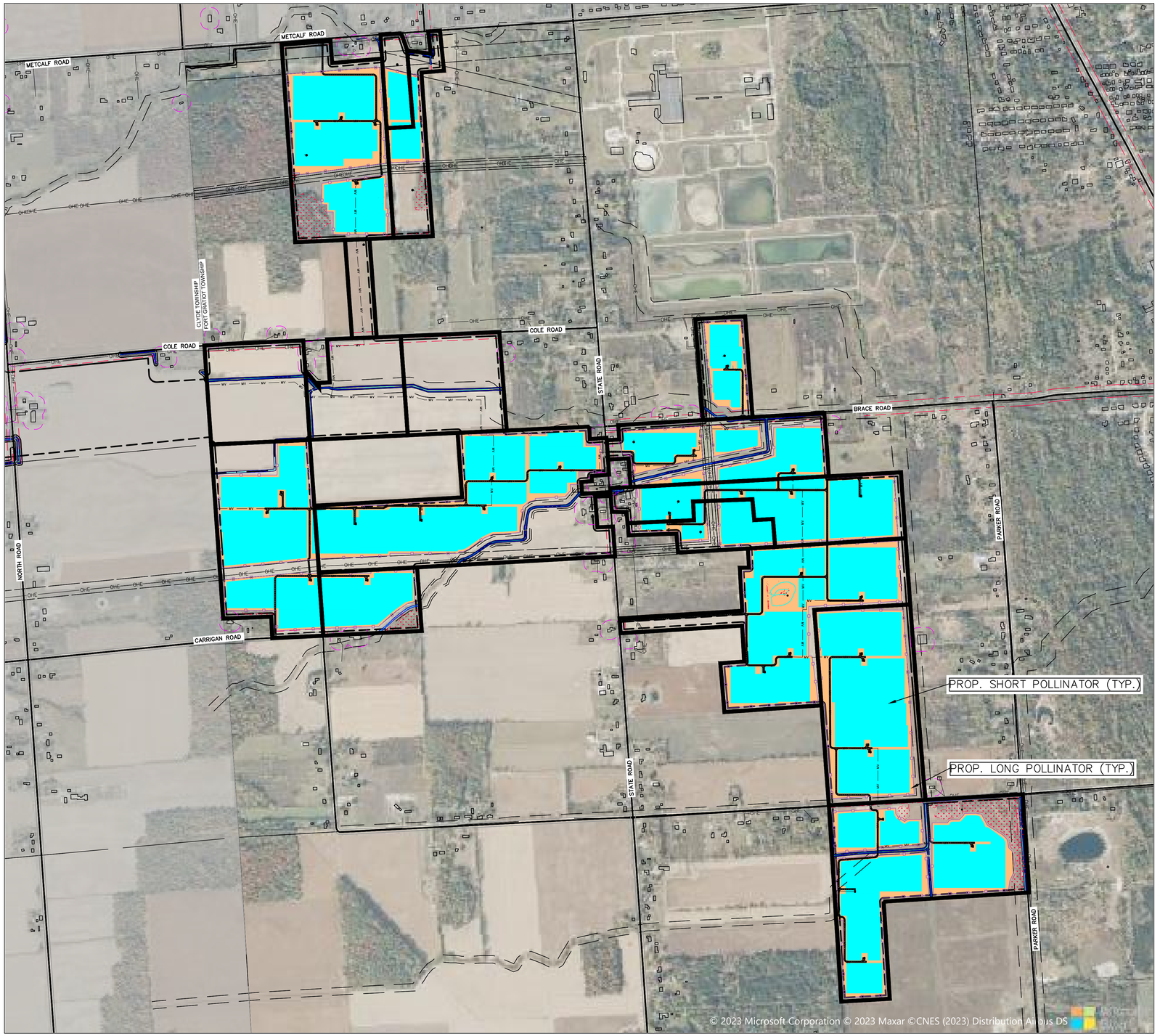
LANDSCAPING PLAN

DATE: 8/17/2023

REVISIONS

SCALE: 0 350 700
1" = 700 FEET
DR. MB | CH. ES
P.M. ES
BOOK --
JOB 22005894
SHEET NO. 12

PRELIMINARY PLANS - NOT FOR CONSTRUCTION



GENERAL NOTES:

1. THE PROJECT PROPOSES POLLINATOR HABITAT BE CREATED WITHIN ALL FENCED IN AREAS.
2. PLANTING MIXES TO BE USED WILL BE DESIGNED TO MEET A SCORE OF 76 OR MORE ON THE MICHIGAN POLLINATOR HABITAT PLANNING SCORECARD FOR SOLAR SITES. FINAL SEED MIXES WILL BE DETERMINED AND APPROVED OF BEFORE CONSTRUCTION.
3. A SHORT VEGETATION SEED MIX WILL BE USED UNDER SOLAR ARRAY PANELS, TOTALING APPROXIMATELY 423 ACRES.
4. A LONG VEGETATION SEED MIX WILL BE USED WITHIN ALL OTHER FENCED IN AREAS NOT INCLUDING ACCESS ROADS, TOTALING APPROXIMATELY 91 ACRES.
5. EACH SEED MIX WILL BE GUARANTEED NOT TO CONTAIN MICHIGAN INVASIVE SPECIES OR NOXIOUS WEEDS.
6. POLLINATOR HABITAT WILL BE MANAGED IF INVASIVE SPECIES OR NOXIOUS WEEDS EXCEEDS 10% OF THE VEGETATION WITHIN AN AREA.
7. REFER TO SHEET 16 FOR ADDITIONAL PLANTING NOTES.

LEGEND

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- EXIST. ROAD R.O.W.
- EXIST. ROAD CENTERLINE
- EXIST. SECTION / QUARTER SECTION
- EXIST. TOWNSHIP BOUNDARY
- NON-PARTICIPATING PARCEL BOUNDARY
- PARTICIPATING PARCEL BOUNDARY
- EXIST. OVERHEAD ELECTRICAL
- EXIST. STRUCTURE
- EXIST. STORM SEWER
- PROP. UNDERGROUND COLLECTION
- PROP. SOLAR ARRAY
- PROP. FENCE
- PROP. GRAVEL ACCESS DRIVE
- PROP. INVERTOR
- PROP. SHORT POLLINATOR MIX
- PROP. LONG POLLINATOR MIX

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SECTIONS: 5-8, 17
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FORT GRATIOT TOWNSHIP
ST. CLAIR COUNTY, MICHIGAN

CLIENT: PORTSIDE SOLAR, LLC

PROJECT: PORTSIDE SOLAR
SPECIAL LAND USE PERMIT - SITE PLANS

VEGETATION PLAN

DATE 8/17/2023

REVISIONS

SCALE 0 350 700
1" = 700 FEET

DR. MB	CH. ES
P.M. ES	
BOOK --	
JOB 22005894	
SHEET NO. 13	

PRELIMINARY PLANS - NOT FOR CONSTRUCTION

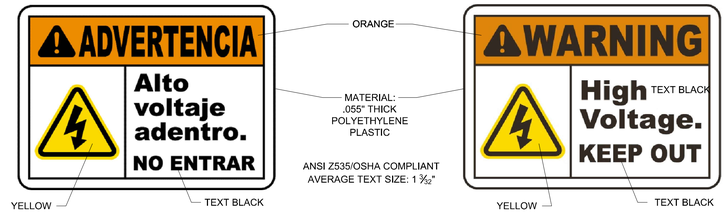
SIGNAGE DETAILS

WARNING:
HAZARDOUS VOLTAGE
AUTHORIZED ACCESS
ONLY

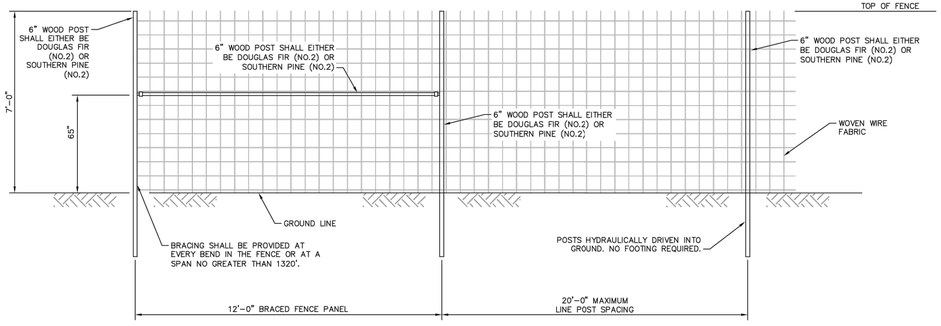
NOTES:

1. TOP OF SIGN TEXT 125 mm (5") MIN CLEAR SPACE FROM GATE OR DOOR JAMB (STRIKE SIDE).
2. PROVIDE A BLANK PANEL FOR BACK SIDE.
3. CONTRAST BETWEEN CHARACTER, SYMBOLS AND THEIR BACKGROUND SHALL BE 70% MINIMUM AND HAVE A NON-GLARE FINISH.
4. CHARACTERS SHALL HAVE A WIDTH-TO-HEIGHT RATIO OF BETWEEN 3:5 AND 1:1 AND A STROKE WIDTH-TO-HEIGHT RATIO OF BETWEEN 1:5 AND 1:10.
5. SIGN SHALL BE 1 mm (0.04") THK (MIN) ALUMINUM SHEET.
6. RAISED UPPERCASE LETTER 1 mm (5/32") TALL, MIN.
7. FOR PCS TRANSFORMER MV COMPARTMENT.

AUTHORIZED PERSONNEL SIGNAGE
NO SCALE

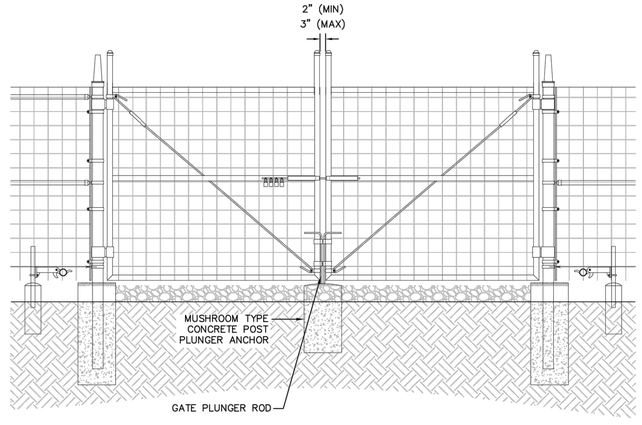


WARNING SIGNS
NO SCALE



NOTES:
1. WOVEN WIRE SHALL BE 2096-12 WIRE OR OWNER APPROVED EQUAL.
2. WIRE COATING SHALL BE CLASS 3 GALVANIZED, ZINC ALUMINUM BEZINAL COATING OR PAINTED BLACK BEZINAL COATING AS SPECIFIED BY OWNER.
3. NO BARBED WIRE SHALL BE INSTALLED.
4. FENCES SHALL BE LOCATED A MINIMUM OF 15' FROM PANELS.

1 WOVEN WIRE FENCING DETAIL — SCALE: NTS



2 PERIMETER VEHICULAR GATE DETAIL — SCALE: NTS

NOTE: ALL DETAILS REPRESENTED ON THIS PLAN SHEET ARE CONCEPTUAL IN NATURE, PROVIDED ONLY TO INDICATE A GENERAL OVERVIEW OF PROPOSED PROJECT FACILITIES, AND ARE EXPECTED TO BE MODIFIED AND REFINED.

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FORT GRATIOT TOWNSHIP
ST. CLAIR COUNTY, MICHIGAN

CLIENT: PORTSIDE SOLAR, LLC
PROJECT: PORTSIDE SOLAR
SPECIAL LAND USE PERMIT - SITE PLANS

SECURITY DETAILS

DATE 8/17/2023

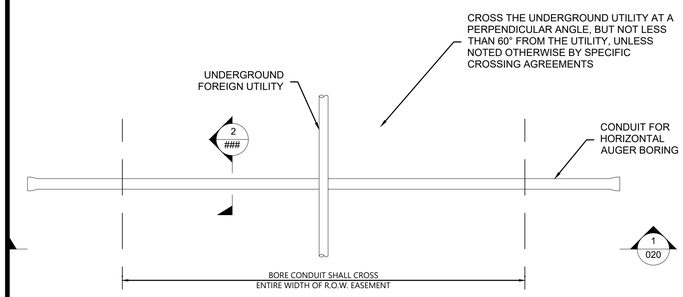
REVISIONS

DR.	MB	CH.	ES
P.M.	ES		
BOOK	--		
JOB	22005894		
SHEET NO.	14		

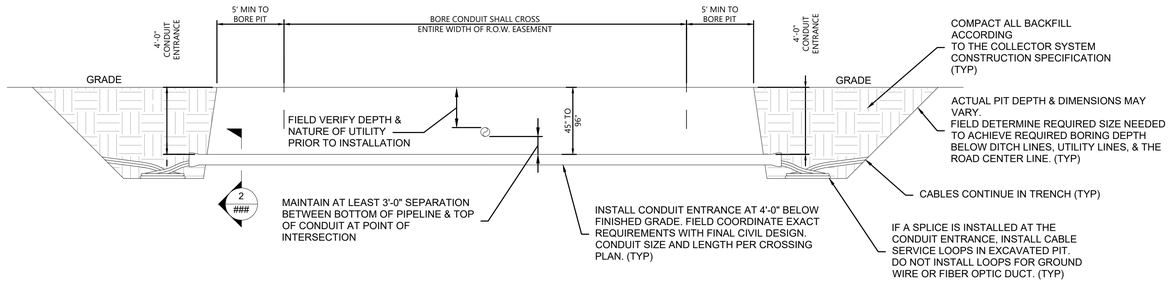
CAD FILE: FORT GRATIOT-07-DETL.DWG

FILE NAME: \\atwfpnet-data\Shared-Projects\22005894 - Ranger Power - Portside Solar\SWD\Plan Sets\Fort Gratiot SUP\Fort Gratiot-07-DETAILS.dwg LAST SAVED BY: eschenk 8/8/2023 11:10 AM PLOTTED BY: Ernest Schenk 8/8/2023 PAPER: ARCH FULL BLEED D (24.00 X 36.00 INCHES) DEVICE: DWG to PDF.PC3 PLOT STYLE: BASE-HALFSIZE.CTB

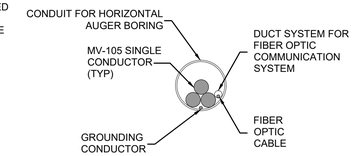
PRELIMINARY PLANS - NOT FOR CONSTRUCTION



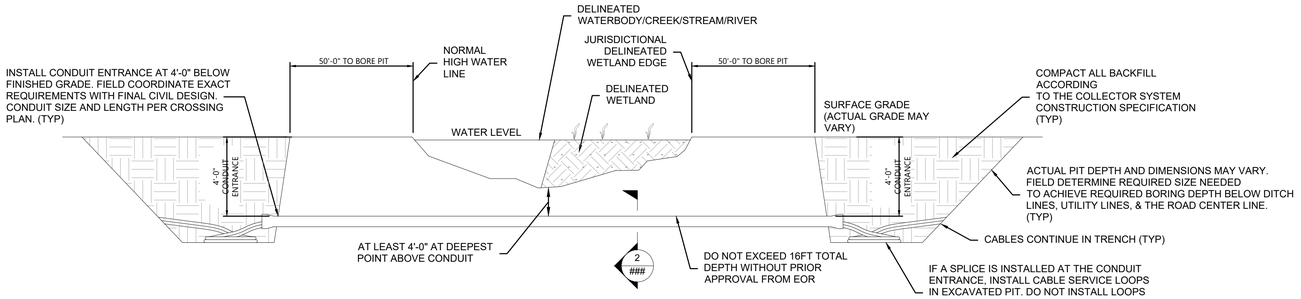
TYPICAL UTILITY CROSSING PLAN
NOT TO SCALE



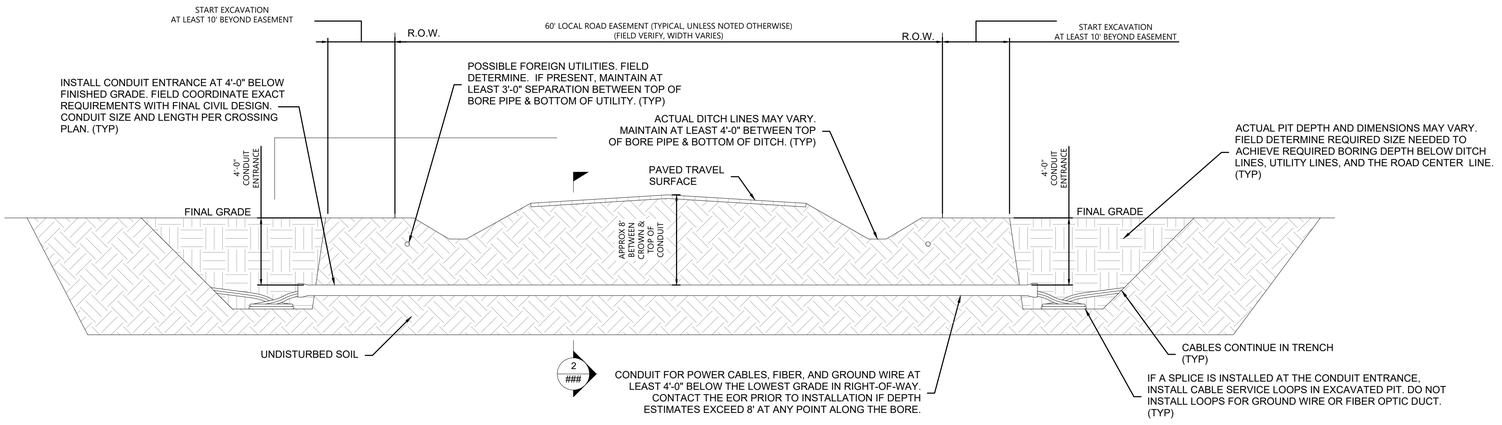
SECTION 1
TYPICAL UTILITY CROSSING SECTION
SEE THIS DWG
NOT TO SCALE



SECTION 2
TYPICAL BORE SECTION
SEE THIS DWG
NOT TO SCALE

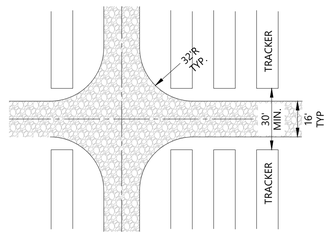


TYPICAL NATURAL FEATURE CROSSING SECTION
NOT TO SCALE

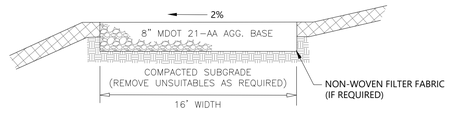


TYPICAL ROAD CROSSING SECTION
NOT TO SCALE

ACCESS ROAD & GRADING DETAILS



PRELIMINARY ACCESS DRIVE GEOMETRY
(PLAN VIEW)
NO SCALE



NOTES:
1. REMOVE TOPSOIL AND ALL UNSUITABLE MATERIAL AS REQUIRED AND REPLACE WITH GRAVEL.
2. ACCESS DRIVES TO SLOPE IN THE DIRECTION OF THE EXISTING GRADE AT A MINIMUM OF 2.0%. DRIVEWAY SHALL BE GRADED TO ALLOW STORMWATER TO SHEET ACROSS IT AND TO PREVENT PUDDLING.
3. PROOF ROLL TO MEET COMPACTION REQUIREMENTS, IF COMPACTION CANNOT BE MET USE FILTER FABRIC.
4. FILTER FABRIC SHALL MEET THE REQUIREMENTS OF MDOT SPEC 910.03.C (GEOTEXTILE SEPARATOR) AND SHALL BE PLACED OVER THE CLEARED AREA PRIOR TO THE PLACING OF ROCK.
5. REFER TO MDOT SPEC SECTIONS 302 (AGGREGATE BASE COURSE), 306 (AGGREGATE SURFACE COURSE), 308 (GEOTEXTILES FOR BASE), 902 (AGGREGATES) AND 910 (GEOSYNTHETICS).
6. ALL ACCESS ROAD SUBGRADES SHALL BE COMPACTED TO NOT LESS THAN 95% STANDARD PROCTOR.

ACCESS DRIVE CROSS SECTION
NO SCALE

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FORT GRATIOT TOWNSHIP
ST. CLAIR COUNTY, MICHIGAN

CLIENT: PORTSIDE SOLAR, LLC
PROJECT: PORTSIDE SOLAR
SPECIAL LAND USE PERMIT - SITE PLANS

CROSSING & ACCESS ROAD DETAILS

DATE: 8/17/2023

REVISIONS

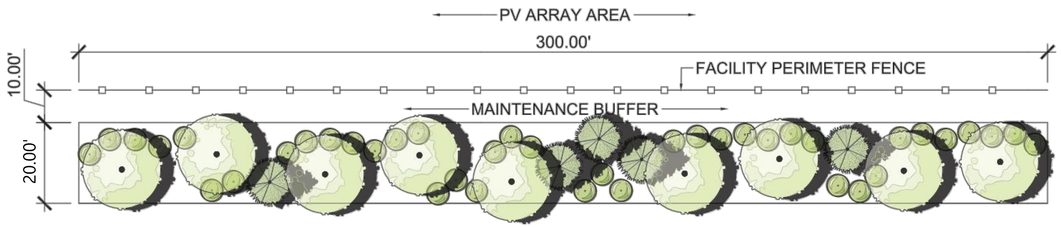
DR. MB | CH. ES
P.M. ES
BOOK --
JOB 22005894
SHEET NO. 15

CAD FILE: FORT GRATIOT-07-DET.DWG

PRELIMINARY PLANS - NOT FOR CONSTRUCTION

PROPOSED SCREENING DETAIL

1. A MIX OF EVERGREEN TREES, DECIDUOUS TREES, AND SHRUBS IS PROPOSED WITHIN VEGETATIVE SCREENING AREAS FOR THE PROJECT ALONG NON-PARTICIPATING RESIDENTIAL OR PUBLIC USES WHERE ADEQUATE SCREENING DOES NOT EXIST.
2. TREES AND SHRUBS TO BE STAGGERED IN ROWS WITHIN A 20' VEGETATION BUFFER,
3. LARGE DECIDUOUS TREES STARTING SIZE OF A LEAST 2.5 CALIPER INCHES. PLACED NOT MORE THAN 30' ON CENTER.
4. LARGE EVERGREEN TREES STARTING SIZE OF AT LEAST 6' IN HEIGHT. PLACED NOT MORE THAN 20' ON CENTER.
5. MEDIUM SHRUBS STARTING SIZE OF AT LEAST 30 INCHES IN HEIGHT. PLACED NOT MORE THAN 6' ON CENTER.
6. A 10' MINIMUM MAINTENANCE BUFFER WILL BE USED BETWEEN THE PROPOSED VEGETATIVE SCREENING AND PERIMETER FENCING.



PROPOSED PLANTING SCHEDULE *

LARGE DECIDUOUS TREE — 9
Acer saccharum / Sugar Maple
Quercus alba / White Oak
Quercus macrocarpa / Bur Oak
Quercus rubra / Red Oak
Tilia americana / American Linden

LARGE EVERGREEN — 5
Abies balsamea / Balsam Fir
Abies concolor / White Fir
Picea glauca / White Spruce
Pinus resinosa / Red Pine
Pinus strobus / White Pine

MEDIUM SHRUB — 40
Aronia melanocarpa / Black Chokeberry
Cornus amomum / Silky Dogwood
Cornus sericea / Red Twig Dogwood
Corylus americana / American Hazelnut
Lindera benzoin / Spicebush

* NOTE: THE ABOVE SPECIFIED SPECIES COULD BE SUBJECT TO LOCAL AVAILABILITY (WITHIN 150 MILES OF THE PROJECT), ANY SUBSTITUTIONS DUE TO LIMITED AVAILABILITY WILL BE OF SIMILAR SPECIES NATIVE TO MICHIGAN AND WILL BE APPROVED ADMINISTRATIVELY BY THE TOWNSHIP.

STORMWATER DRAINAGE

THE CONVERSION OF LAND USED FOR AGRICULTURAL CROP DEVELOPMENT TO SOLAR ARRAY WITH PREDOMINANTLY GRASSY GROUND COVER AND GRAVEL ACCESS DRIVEWAYS WILL REDUCE THE OVERALL RUNOFF GENERATED BY THE PROPOSED SITE. THERE ARE THREE KEY VARIABLES THAT DETERMINE THE AMOUNT OF RUNOFF WHEN USING EITHER THE RATIONAL METHOD OR THE STATE OF MICHIGAN EGLE METHODOLOGY DOCUMENT 'COMPUTING FLOOD DISCHARGES FOR SMALL UNGAGED WATERSHEDS'

1. DRAINAGE AREA: THE PROJECT DOES NOT PROPOSE TO ALTER THE NATURAL DRAINAGE PATTERNS. GRADING FOR THE PROJECT WILL BE LIMITED TO SMOOTHING LARGER HUMPS AND DIPS AS NECESSARY TO ALLOW FOR THE ARRAY TRACKERS TO MEET VENDOR AND TOWNSHIP REQUIREMENTS FOR MINIMUM HEIGHT AND MAXIMUM HEIGHT. THEREFORE THE DRAINAGE AREAS FOR EXISTING AND PROPOSED CONDITIONS ARE THE SAME.
2. TIME OF CONCENTRATION: AS NOTED ABOVE, GRADING WILL BE LIMITED TO LOCALIZED HUMPS AND DIPS, AND WILL NOT HAVE AN IMPACT ON THE LENGTH OF DRAINAGE PATTERNS ONSITE. THEREFORE THE TIME OF CONCENTRATION FOR EXISTING AND PROPOSED CONDITIONS ARE THE SAME.
3. LAND USE / GROUND COVER: THE RATIONAL METHOD IS SIMPLISTIC IN ITS CONSIDERATION OF GROUND COVER (TYPICALLY LIMITED TO PERVIOUS OR IMPERVIOUS), THEREFORE THE MORE COMPREHENSIVE EGLE METHODOLOGY IS MORE SUITABLE TO ACCOUNT FOR THE LAND USE CHANGE FROM AGRICULTURAL CROP DEVELOPMENT TO A VEGETATED GRASSY MEADOW COVER BENEATH THE ARRAY. PER THE EGLE METHOD, THE RUNOFF CURVE NUMBERS (CN) ARE LISTED BELOW FOR COMPARISON WHERE IT CAN BE SEEN THAT THE COMBINATION OF GRASSY MEADOW AND GRAVEL DRIVEWAYS HAS A MUCH LOWER CN THAN THE AGRICULTURAL CROP CONDITION, AND IS LESS THAN OR EQUAL TO A WOODED CONDITION.

HYDROLOGIC SOIL GROUP:	A	B	C	D
ROW CROPS, GOOD CONDITION	67	78	85	89
WOODS, AVERAGE CONDITION	36	60	73	79
MEADOW	30	58	71	78
IMPERVIOUS (GRAVEL)	98	98	98	98
MEADOW (97%) W/ GRAVEL (3%*)	32	59	72	79

*GRAVEL COVER IS TYPICALLY 3% OR LESS WITHIN THE ARRAY AREA

THEREFORE AS A RESULT, THE OVERALL RUNOFF FROM THE SITE WILL NOT BE INCREASED (POST-DEVELOPMENT RUNOFF WILL NOT EXCEED PRE-DEVELOPMENT RUNOFF) AND NO PERMANENT STORMWATER MANAGEMENT FACILITIES ARE NECESSARY.

THIS CONCLUSION IS CONSISTENT WITH A STUDY PERFORMED BY ASCE THAT COMPARED RUNOFF FROM AN EXISTING GRASSY (MEADOW) LAND COVER WITH AND WITHOUT A SOLAR ARRAY INSTALLED, WHERE IT WAS DETERMINED THAT THE SMALL AMOUNT OF RUNOFF INCREASE FROM THE ARRAY WOULD NOT WARRANT THE NEED FOR STORMWATER DETENTION FACILITIES. IT'S IMPORTANT TO NOTE THAT THE ASCE COMPARISON WAS BASED ON A CONDITION WHERE THE EXISTING LAND COVER WAS THE SAME AS THE ARRAY CONDITION (BOTH GRASSY MEADOW), AND DID NOT REFLECT A CHANGE FROM A HIGHER CN CONDITION (CROPS) TO A GRASSY MEADOW CONDITION (ARRAY). A COPY OF THE ASCE CAN BE PROVIDED FOR REFERENCE.

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ST. CLAIR COUNTY, MICHIGAN

CLIENT: PORTSIDE SOLAR, LLC
PROJECT: PORTSIDE SOLAR
SPECIAL LAND USE PERMIT - SITE PLANS
LANDSCAPING & VEGETATION DETAILS

DATE: 8/17/2023

REVISIONS

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JOB 22005894
SHEET NO. 16

CAD FILE: FORT GRATIOT-07-DET_RECOVER.DWG

FILE NAME: S:\22005894 - Roger Power - Portside Solar\DWG\Plan Set\Civil Detail SLUP\Civil Detail-07-DET_Recover.dwg LAST SAVED BY: mshenk 8/8/2023 3:56 PM PLOTTED BY: Ernest Schenk 8/8/2023 PAPER: ARCH FULL BLEED D (24.00 X 36.00 INCHES) DEVICE: DWG To PDF.PC3 PLOT STYLE: BASE-HALFSIZE.CTB

PRELIMINARY PLANS - NOT FOR CONSTRUCTION

1.Introduction

Canadian Solar is one of the world's largest suppliers of solar photovoltaic modules, system solutions, and one of the largest solar power plant developers. By October 2022, Canadian Solar has shipped more than 80GW solar modules to customers in over 160 countries worldwide and owns a global portfolio of 25GW solar PV projects and 40GWh energy storage projects. CSI solar, the majority-owned subsidiary of Candian Solar, expanded its module manufacturing capacity to 32GW in 2022 and expects to reach 50GW module manufacturing capacity by the end of 2023. In 2022, Canadian Solar was again recognized as one of the most bankable PV module brands in the world by Bloomberg New Energy Finance.

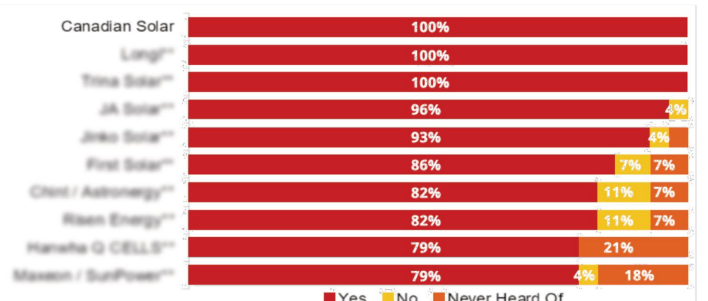


Figure 1. The world's top 10 most bankable PV module brands in BNEF's 2022 survey

CSI Solar focuses on continuously improving the performance and reliability of its solar modules and providing high quality products to customers, by actively exploring and introducing new cell and module technologies. CSI Solar was one of the first companies introducing cell and module technologies that later became industry mainstream, such as bifacial modules (back in 2010), modules with larger-format wafers (up to 210mm) and, nowadays, N-type high-efficiency cells and modules. Since 2019, CSI Solar has been developing N-type TOPCon (Tunnel Oxide Passivated Contacts) technologies, and now launches a diversified TOPCon module portfolio covering both 182mm and 210mm cells, single-glass and double-glass encapsulation, and various module sizes and power outputs to satisfy different application scenarios.

Figure 2. CSI TOPCon Module Family

1

Module Power (W)	420~435	560~580	555~570	620~635	680~700
Module Type	CS6R-T	CS6W-T	CS6W-TB-AG	CS7L-TB-AG	CS7N-TB-AG
Module Efficiency	22.30%	22.50%	22.10%	22.40%	22.50%
Module Size (mm)	1722×1134×30	2278×1134×30	2278×1134×30	2172×1303×33	2384×1303×33

Table 1. Key Parameters of CSI TOPCon Modules

Module	PERC Bifacial-660W	TOPCon Bifacial-685W
Power (W)	660	685
Module area(m2)	3.11	3.11
Module efficiency	21.20%	22.10%
Module Open-Circuit Voltage(V)	45.4	47.1
Annual Degradation Rate	0.45%	0.40%
Site	Los Angeles, USA	
DC System Size (MWdc)	28.7	
DC/AC Ratio	1.3	
Project site area (m2)	Same area	
Installation Method	Single-axis tracked (1 row portrait installation)	
Service Life	30 years	
Ground Coverage Ratio	0.313	0.301
Pitch (m)	7.62	7.91
Module Number/String	31	30
String Number per rack	2	
Module Number per rack	62	61
Module Power per rack (W)	40,920	41,785
Length of rack (m)	83.4	80.8
Total Module Area per rack (m2)	192.6	186.4

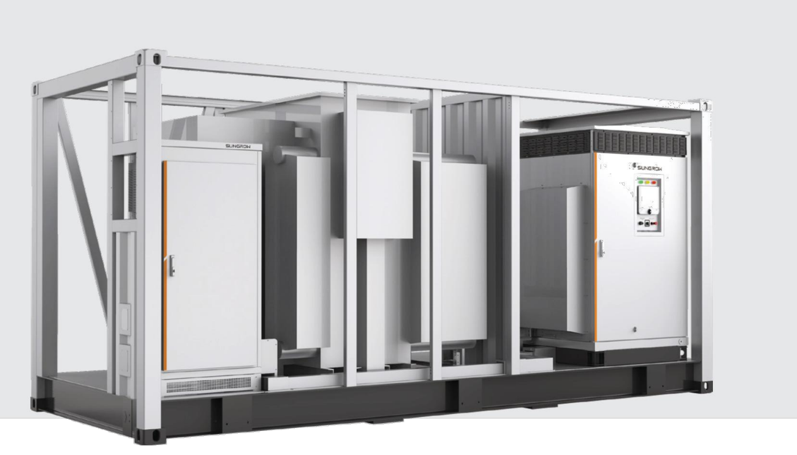
Table 3. Parameters used in system performance simulation

MODULE DETAILS
NO SCALE

GENERAL MODULE NOTES:
1. THE PROJECT ANTICIPATES TO UTILIZE A CSI HIGH EFFICIENCY TOPCON 690W MODULE, OR SIMILAR.

SG3425UD-MV/ SG3600UD-MV

Turnkey Station for North America 1500 Vdc System - MV Transformer Integrated



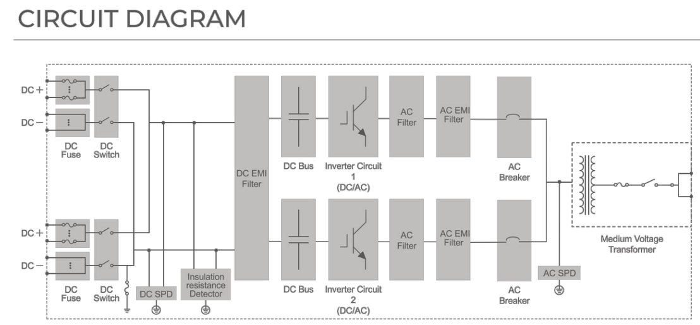
HIGH YIELD
- Advanced three-level technology, max. efficiency 98.9%
- Inverter full power operation up to 45 ℃ (113 ℉)
- Effective cooling, wide operation temperature
- Max. DC/AC ratio up to 2.0

EASY O&M
- Integrated current, voltage and MV parameters monitoring function for online analysis and trouble shooting
- Modular design, easy for maintenance

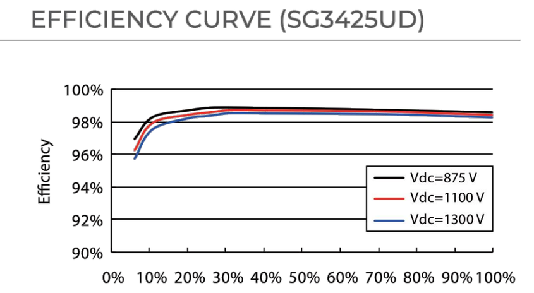
SAVED INVESTMENT
- Low transportation and installation cost due to 20-foot container size design
- DC 1500V system, low system cost
- Integrated MV transformer and LV auxiliary power supply
- Q at night optional

GRID SUPPORT
- Compliance with standards:UL 1741,UL 1741 SA, IEEE 1547, Rule 21 and NEC code
- Low / High voltage ride through (L/HVRT), L/HFRT, soft start/stop
- Active & reactive power control and power ramp rate control

CIRCUIT DIAGRAM



EFFICIENCY CURVE (SG3425UD)

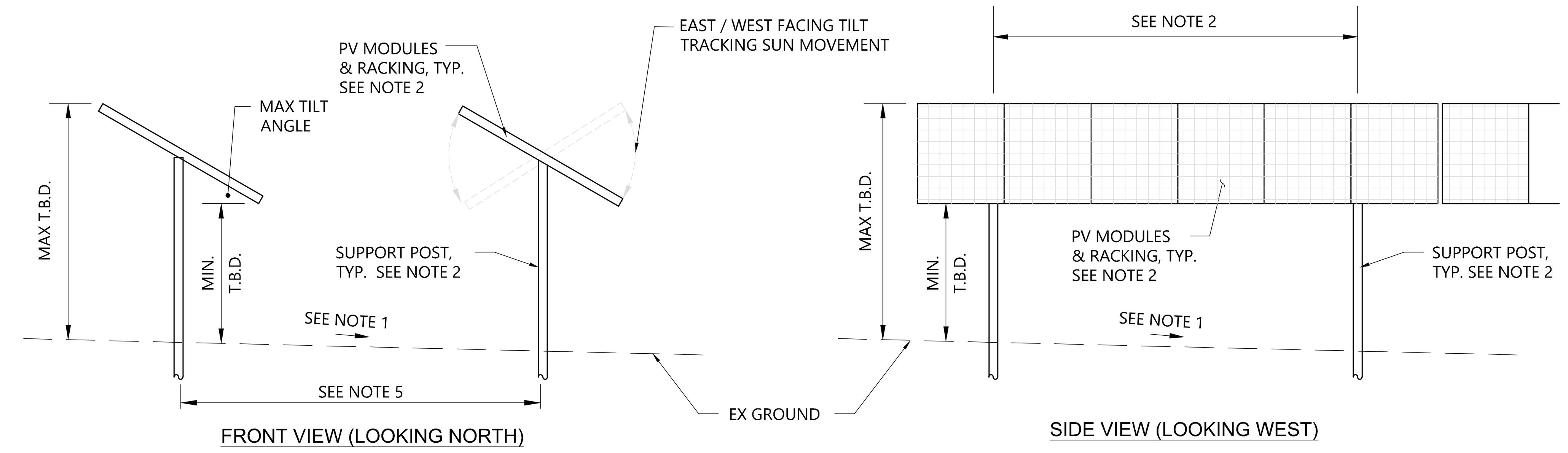


SUNGROW
Clean power for all

Type designation	SG3425UD-MV	SG3600UD-MV
Input (DC)		
Max. PV input voltage	1500 V	
Min. PV input voltage / Startup input voltage	875 V / 915 V	915 V / 955 V
Available DC fuse sizes	250 A - 630 A	
MPP voltage range	875 V - 1500 V	915 V - 1500 V
Full power MPP voltage range @ 45 ℃	875 V – 1300 V *	915 V – 1300 V *
No. of independent MPP inputs	1	
No. of DC inputs	24 (optional : 28)	
Max. DC short-circuit current	2 Switches / 5000 A (Optional : 4 Switches / 10000 A)	
PV array configuration	Negative grounding (Optional : Floating)	
Output (AC)		
AC output power	3425 kVA @ 45 ℃ (113 °F) 3083 kVA @ 50 ℃ (122 °F) **	3600 kVA @ 45 ℃ (113 °F) 3240 kVA @ 50 ℃ (122 °F)**
Nominal grid frequency / Grid frequency range	50 Hz / 45 – 55 Hz, 60 Hz / 50 – 65 Hz	
THD	< 3 % (at nominal power)	
Power factor at nominal power / Ajustable power factor	> 0.99 / 0.8 leading - 0.8 lagging	
Efficiency		
Inverter Max. efficiency	98.9 %	
Inverter CEC efficiency	98.5 %	
Transformer		
Transformer rated power	3425 kVA	3600 kVA
Transformer Max. power	3425 kVA	3600 kVA
LV / MV voltage	0.6 kV / (12 – 35) kV	0.63 kV / (12 – 35) kV
Transformer vector	Dy 1 (Optional: Dy 11, Yny 0)	
Transformer cooling type	KNAN (Optional : ONAN)	
Protection		
DC input protection	Load switch + fuse	
Inverter output protection	Circuit breaker	
AC MV output protection	Load switch + fuse	
Overvoltage protection	DC Type II / AC Type II	
Grid monitoring / Ground fault monitoring	Yes / Yes	
Insulation monitoring	Yes	
Overheat protection	Yes	
General Data		
Dimensions (W*H*D)	6058 mm * 2896 mm * 2438 mm 238.5'' * 114.0'' * 96.0''	
Weight	18000 kg 39683.2 lbs	
Degree of protection	NEMA 4X (Electronic for Inverter) / NEMA 3R (Others)	
Auxiliary power supply	5 kVA , 120 Vac ; Optional : 30 kVA 480 Vac + 5 KVA 120 Vac	
Operating ambient temperature range(it refers to the ambient temperature of 1m around the inverter.)	-35 to 60 ℃ (> 45 ℃ derating) / optional: -40 to 60 ℃ (> 45 ℃ derating) -22 to 140 °F (> 113 °F derating) / optional: -40 to 140 °F (> 113 °F derating)	
Allowable relative humidity range	0 - 100 %	
Cooling method	Temperature controlled forced air cooling	
Max. operating altitude	1000 m (Standard) / > 1000 m (Customized) (3280.8 ft (standard) / > 3280.8 ft (Customized))	
DC-coupled storage interface	Optional	
Charging power from the grid	Optional	
Communication	Standard: RS485, Ethernet	
Compliance	UL 1741, IEEE 1547, UL1741 SA, NEC 2017, CSA C22.2 No.107.1-01	
Grid support	Q at night function (optional), L/HVRT, L/HFRT, Active & reactive power control and power ramp rate control, Volt-var, Frequency-watt	

*Full power MPP range is temperature dependent, check the characteristic curve of the inverter for more information.
**For sustained operation above 40°C, an optional 60 °C temperature rise transformer is recommended.

INVERTER STATION DETAILS
NO SCALE



FRONT VIEW (LOOKING NORTH)

SIDE VIEW (LOOKING WEST)

CONCEPTUAL SOLAR PV TRACKER DETAIL
NO SCALE

GENERAL ARRAY NOTES:
1. SITE DRAINAGE IS INTENDED TO FOLLOW NATURAL DRAINAGE PATTERNS WITH LOCALIZED GRADING AS REQUIRED TO MEET TRACKER VENDOR REQUIREMENTS FOR MAX SLOPE AND POST HEIGHT TOLERANCES.
2. FINAL PV MODULE RACKING CONFIGURATION AND SUPPORT POST DESIGN (SIZE, EMBEDMENT DEPTH, SPACING, ETC.) TO BE DETERMINED DURING THE ENGINEERING PHASE.
3. SOLAR MODULES SHALL NOT BE INSTALLED WITHIN REQUIRED PERIMETER SETBACK AREAS.
4. PROPOSED SPACING BETWEEN ROWS ±23 FEET, SUBJECT TO CHANGE PENDING FINAL DESIGN.

SUP/SITE PLAN NOTES FORT GRATIOT TOWNSHIP

OWNER COMMITMENTS

DESIGN STANDARDS

1. ACCESS ROAD SIZING:
1.1. 16' WIDE CLEARANCE REQUIRED FOR EMERGENCY PATHWAYS LEADING TO INVERTERS.

SETBACKS

2. A MINIMUM SETBACK DISTANCE OF FIFTY (50) FEET OF THE EDGE OF THE SOLAR ARRAY TO ALL NON-PARTICIPATING PARCEL PROPERTY LINES. INTERNAL PROPERTY LINES OF PARTICIPATING PARCELS UTILIZED FOR PLACEMENT OF THE SOLAR ARRAY ARE NOT SUBJECT TO ANY SETBACKS.
3. A MINIMUM SETBACK DISTANCE OF FIFTY (50) FEET OF THE EDGE OF THE SOLAR ARRAY TO ROAD RIGHT-OF-WAYS.
4. A MINIMUM SETBACK DISTANCE OF ONE HUNDRED (100) FEET FROM THE EDGE OF A DWELLING REGARDLESS OF IF THE RESIDENCE IS PARTICIPATING OR NOT PARTICIPATING IN THE PROJECT.
5. A MINIMUM SETBACK DISTANCE OF THREE HUNDRED AND FIFTY (350) FEET FROM THE SOLAR ARRAY INVERTER AND EDGE OF A DWELLING REGARDLESS OF IF THE RESIDENCE IS PARTICIPATING OR NOT PARTICIPATING IN THE PROJECT.
6. A VOLUNTARY MINIMUM SETBACK DISTANCE OF TWENTY FIVE (25) FEET FROM PROJECT INFRASTRUCTURE AND NATURAL FEATURES, WHEREVER APPLICABLE.

GLARE STANDARDS

7. ALL SOLAR PANEL ORIENTATION WILL BE DESIGNED IN SUCH A WAY TO MINIMIZE CONCENTRATED SOLAR GLARE ONTO NEARBY PROPERTIES OR ROADWAYS TO THE GREATEST EXTENT PRACTICAL.

SOUND STANDARDS

8. SOUND PRESSURE MAY NOT EXCEED 45 DB(A) AT ANY NON-PARTICIPATING PROPERTY BOUNDARY MEASURED AS LEQ(1 HOUR).

LIGHTING STANDARDS

9. ANY REQUIRED LIGHTING FOR THE SOLAR FACILITY OR BUILDINGS OF THE SOLAR FACILITY SHALL BE DIRECTED AWAY AND BE SHIELDED FROM ADJACENT PROPERTIES AND PUBLIC ROADWAYS.

FENCING STANDARDS

10. THE MAXIMUM HEIGHT OF PERIMETER FENCING FOR FORT GRATIOT TOWNSHIP IS SIX (6) FEET. DUE TO FEDERAL REGULATIONS, THE SOLAR FACILITY SHALL BE COMPLETELY ENCLOSED BY A SEVEN (7) FOOT HIGH PERIMETER FENCE TO RESTRICT UNAUTHORIZED ACCESS.

SAFETY & CERTIFIED COMPONENTS STANDARDS

11. ALL COMPONENTS OF THE SOLAR FACILITY WILL COMPLY WITH THE NATIONAL ELECTRIC SAFETY CODE (NESC) AND INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE),

GENERAL NOTES

1. ARRAY SOURCE: ATWELL, LLC 7/1/23. THIS PLAN IS PRELIMINARY FOR PERMITTING PURPOSES. FINAL ARRAY CONFIGURATION TO BE OPTIMIZED DURING ENGINEERING PHASE.
2. THERE IS NO LIGHTING PROPOSED FOR THE PROJECT, THEREFORE LIGHTING AND PHOTOMETRIC PLANS ARE NOT NECESSARY OR PROVIDED.
3. FINAL STRING SIZING TO BE CONFIRMED BY ENGINEER-OF-RECORD.
4. MV COLLECTION CROSSINGS ARE TBD AFTER MV COLLECTION LAYOUT. ALL CROSSINGS TO BE FINALIZED BY ENGINEER OF RECORD.
5. SITE IS IN FEMA FLOOD ZONE X.
6. CONSTRUCTION IS PLANNED TO START IN EARLY 2025.
7. VEHICULAR AND PEDESTRIAN TRAFFIC, IN RELATION TO STREETS AND SIDEWALKS WILL BE SAFE AND CONVENIENT.
8. CONSTRUCTION: CONSTRUCTION OF THE PROJECT SHALL COMPLY WITH THE NATIONAL ELECTRIC SAFETY CODE (NESC), STATE CONSTRUCTION CODE, AND COUNTY BUILDING CODE.
9. COMPONENTS: COMPONENTS OF THE SOLAR ARRAY SHALL BE APPROVED BY THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE), SOLAR RATING AND CERTIFICATION CORPORATION (SRCC), ELECTRONICS TESTING LABRATORY (ETL), OR OTHER CERTIFICATION ORGANIZATION OF APPROVED BY CITY.
10. DISTRIBUTION, TRANSMISSION & INTERCONNECTION: ALL COLLECTION LINES AND INTERCONNECTIONS FROM THE SOLAR ARRAY TO ANY ELECTRICAL COLLECTION POINT SHALL BE LOCATED AND MAINTAINED UNDERGROUND INSIDE THE FENCED ARRAY, EXCEPT IN AREAS WHERE TECHNICAL OR PHYSICAL CONSTRAINTS MAKE IT PREFERABLE TO INSTALL EQUIPMENT ABOVE GROUND. THIS REQUIREMENT EXCLUDES TRANSMISSION EQUIPMENT MEANT TO CONNECT THE PROJECT TO THE LOCAL TRANSMISSION OR DISTRIBUTION SYSTEM.
11. ALL SCREENING SHALL FOLLOW TOWNSHIP ZONING ORDINANCE STANDARDS - REFER TO LANDSCAPING PLAN. VEGETATIVE COVER CAN BE SEEN ON THE BACKGROUND AERIAL IMAGE.
12. THE PERIMETER OF THE ARRAY WILL BE COMPLETELY ENCLOSED BY PERIMETER FENCING.
13. EXISTING DRAINAGE PATTERNS WILL GENERALLY BE MAINTAINED TO FOLLOW EXISTING CONDITIONS. LOCALIZED GRADING WILL BE PERFORMED AS NECESSARY TO SMOOTH TERRAIN TO SUIT TRACKER VENDOR REQUIREMENTS AND OPTIMIZE POST HEIGHT REQUIREMENTS.
14. DURING CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IMPLEMENTED IN ACCORDANCE WITH PERMITTING REQUIREMENTS OF THE AGENCY HAVING JURISDICTION.
15. FINAL GROUND COVER OF THE ARRAY WILL CONSIST OF GRASSES SUITABLE FOR GROWTH IN THIS AREA WITH MINIMAL MAINTENANCE (NO IRRIGATION). MAINTENANCE WILL CONSIST OF MOWING AS NECESSARY TO AVOID SHADING ON PANELS.
16. EXISTING SURVEY INFORMATION ON THESE PLANS IS BASED ON DESKTOP DATA SOURCES (GIS, ETC.) AND IS NOT SUITABLE TO BE USED FOR CONSTRUCTION. FIELD SURVEY IS REQUIRED TO BE PERFORMED PRIOR TO PROCEEDING WITH DETAILED DESIGN AND IFC DRAWINGS.
17. DRIVEWAY APPROACHES TO AND/OR UTILITY CROSSINGS OF EXISTING COUNTY ROADS SHALL REQUIRE A PERMIT AND BE DESIGNED IN ACCORDANCE WITH ST. CLAIR COUNTY ROAD COMMISSION REQUIREMENTS.
18. CONNECTIONS AND/OR CROSSINGS OF EXISTING COUNTY DRAINS WILL REQUIRE A PERMIT AND BE DESIGNED IN ACCORDANCE WITH ST. CLAIR COUNTY DRAIN COMMISSIONER REQUIREMENTS
19. UNDERGROUND UTILITY CROSSINGS OF COUNTY ROADS, DRAINS, WATERCOURSES AND REGULATED WETLANDS SHALL BE VIA TRENCHLESS INSTALLATION TO MINIMIZE IMPACTS TO THOSE FEATURES.

NOTE: ALL DETAILS REPRESENTED ON THIS PLAN SHEET ARE CONCEPTUAL IN NATURE, PROVIDED ONLY TO INDICATE A GENERAL OVERVIEW OF PROPOSED PROJECT FACILITIES, AND ARE EXPECTED TO BE MODIFIED AND REFINED.

Know what's below. Call before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

ATWELL
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248.447.2000

ST. CLAIR COUNTY, MICHIGAN
FORT GRATIOT TOWNSHIP
TOWN, RANGE: T07N, R17E
SECTIONS: 5-8, 17

CLIENT
PORTSIDE SOLAR, LLC

PROJECT
PORTSIDE SOLAR
SPECIAL LAND USE PERMIT – SITE PLANS

SOLAR DETAILS

DATE 8/17/2023

REVISIONS

DR. MB CH. ES
P.M. ES
BOOK --
JOB 22005894
SHEET NO. 17

CAD FILE: FORT GRATIOT-07-DET_RECOVER.DWG