SQUIRE PATTON BOGGS

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March 23, 2021

Tanowa Troupe
Ohio Power Siting Board
Secretary, Administration/Docketing
180 E. Broad Street, 11th Floor
Columbus, OH 43215

Re: **In the Matter of the Application of Hecate Energy Highland 4, LLC's Application for a Certificate of Environmental Compatibility and Public Need to Construct a Solar-Powered Electric Generating Facility in Clay and Whiteoak Townships in Highland County, Ohio Case No. 20-1288-EL-BGN/Compliance with Condition #12 Regarding Landscape, Lighting, and Vegetation**

Dear Ms. Troupe:

On March 18, 2021, Hecate Energy Highland 4, LLC ("Hecate Energy") was issued a certificate of environmental compatibility and public need by the Ohio Power Siting Board ("Board") to construct a 65 MW solar-powered electric generating facility in Clay and Whiteoak Township, Highland County, Ohio ("Certificate"). The Certificate was issued subject to twenty three (23) conditions.

At this time, Hecate Energy is submitting the Landscape, Lighting, and Vegetation Plan for New Market Solar I. This plan was prepared in consultation with a landscape architect licensed by the Ohio Landscape Architects Board and includes measures that address the aesthetic and lighting impacts of the facility in accordance with the requirements of Condition #12.

With this filing, Hecate Energy will have complied with Condition #12 of the Certificate. If you have questions or need additional information, please do not hesitate to call.

Very truly yours,

Karen A. Winters

cc: Patti Shorr, Hecate Energy LLC
Jared Wren, Hecate Energy LLC
Danelle Gagliardi, Squire Patton Boggs (US) LLP

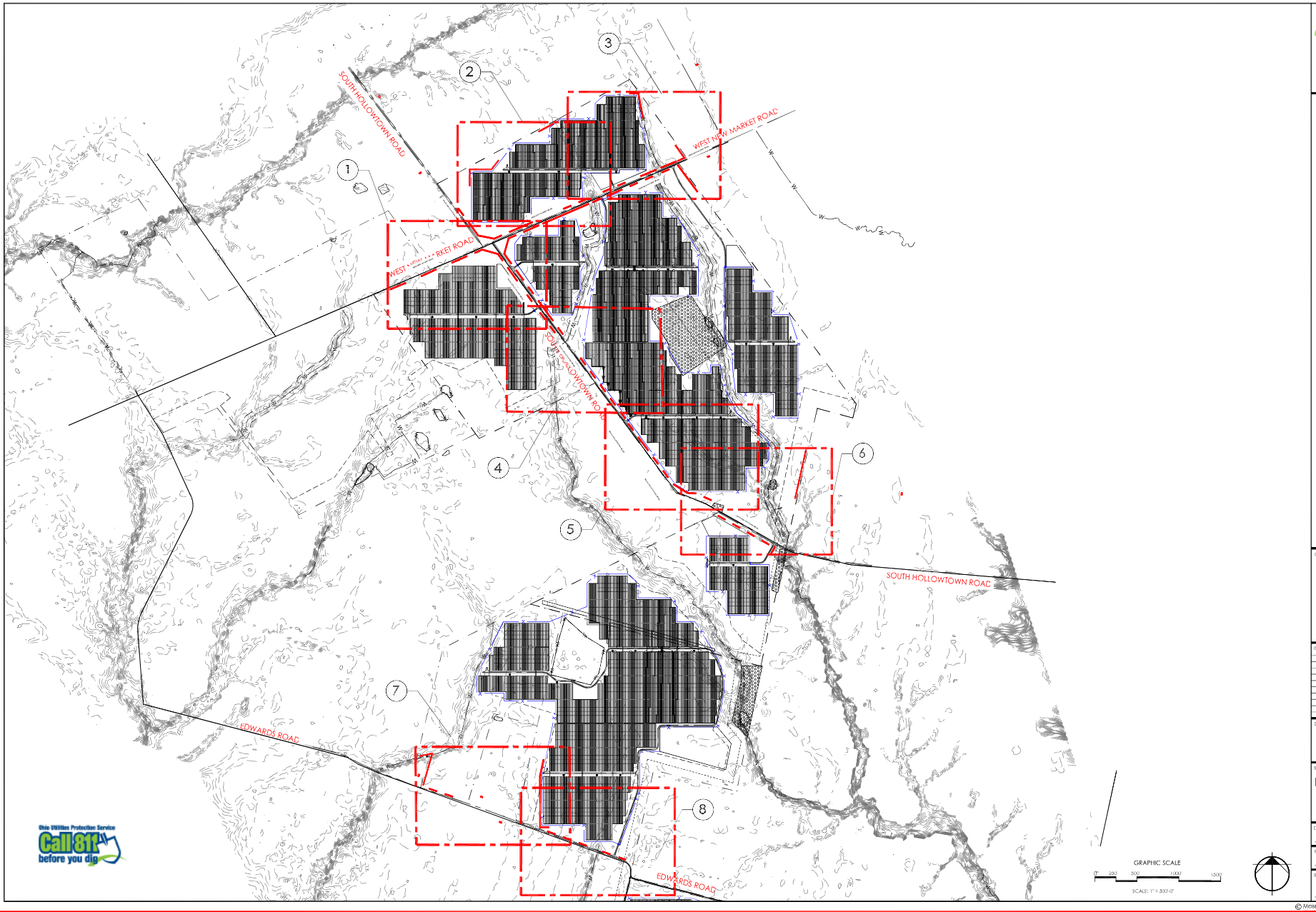
HECATE ENERGY - HIGHLAND 4 NEW MARKET SOLAR I

LANDSCAPE BUFFER SET

HIGHLAND COUNTY, OHIO

date: 03/17/2021

INDEX OF SHEETS



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- I -
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SHEET TITLE:
KEYMAP

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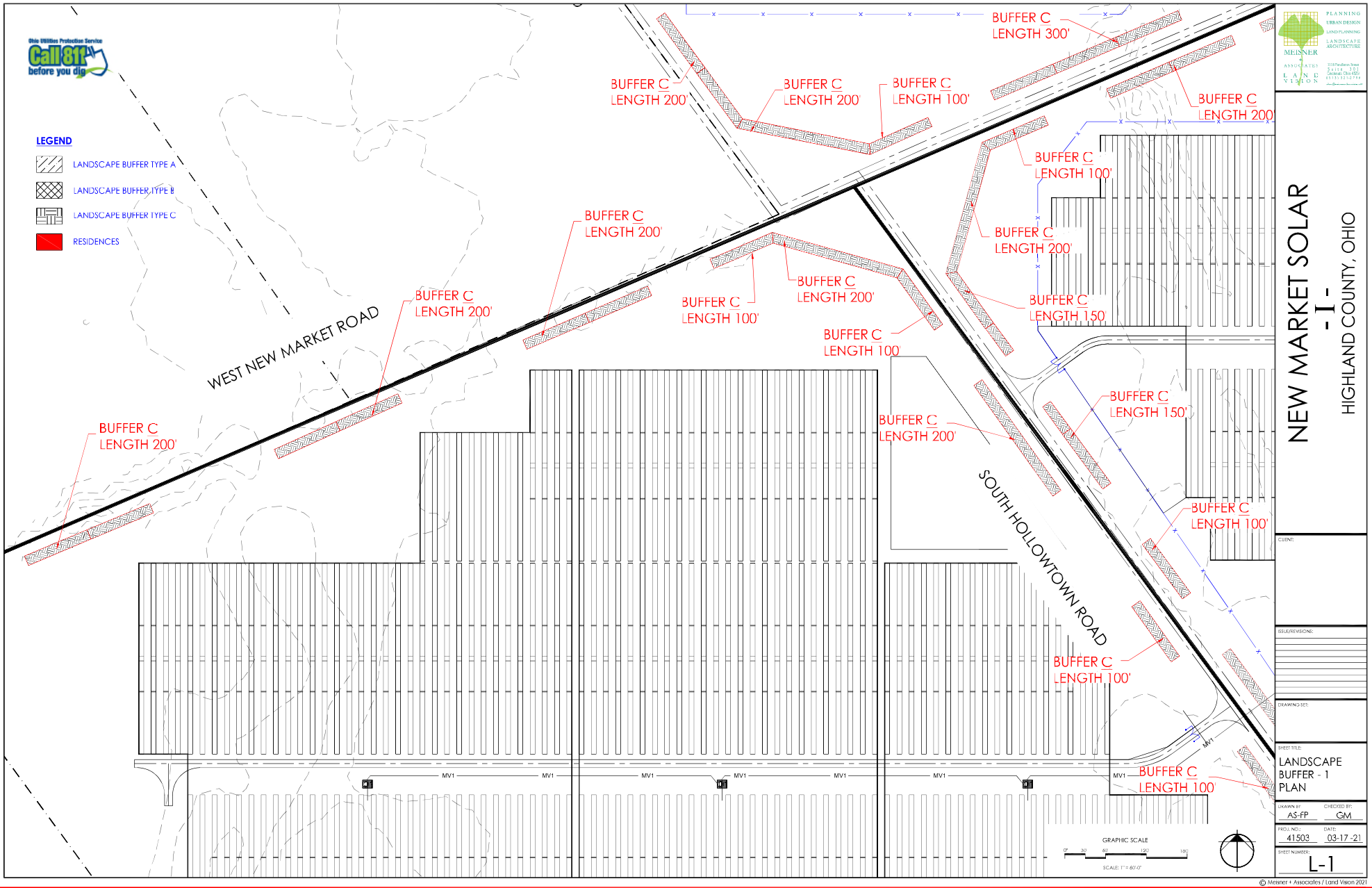
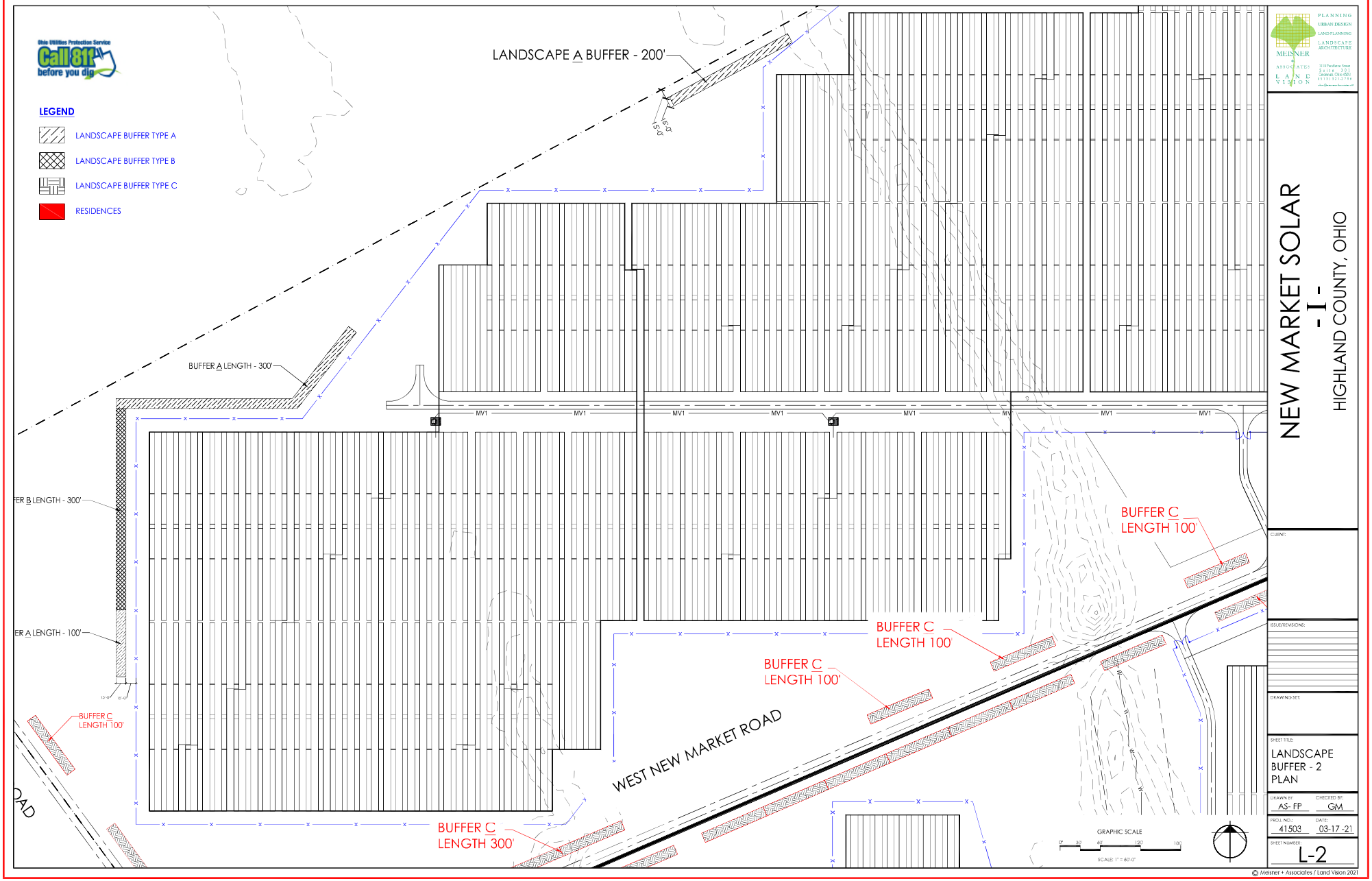
DATE: 03-17-21
SHEET NUMBER: L-0





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SHEET TITLE:
LANDSCAPE
BUFFER - 2
PLAN

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DATE: 03-17-21
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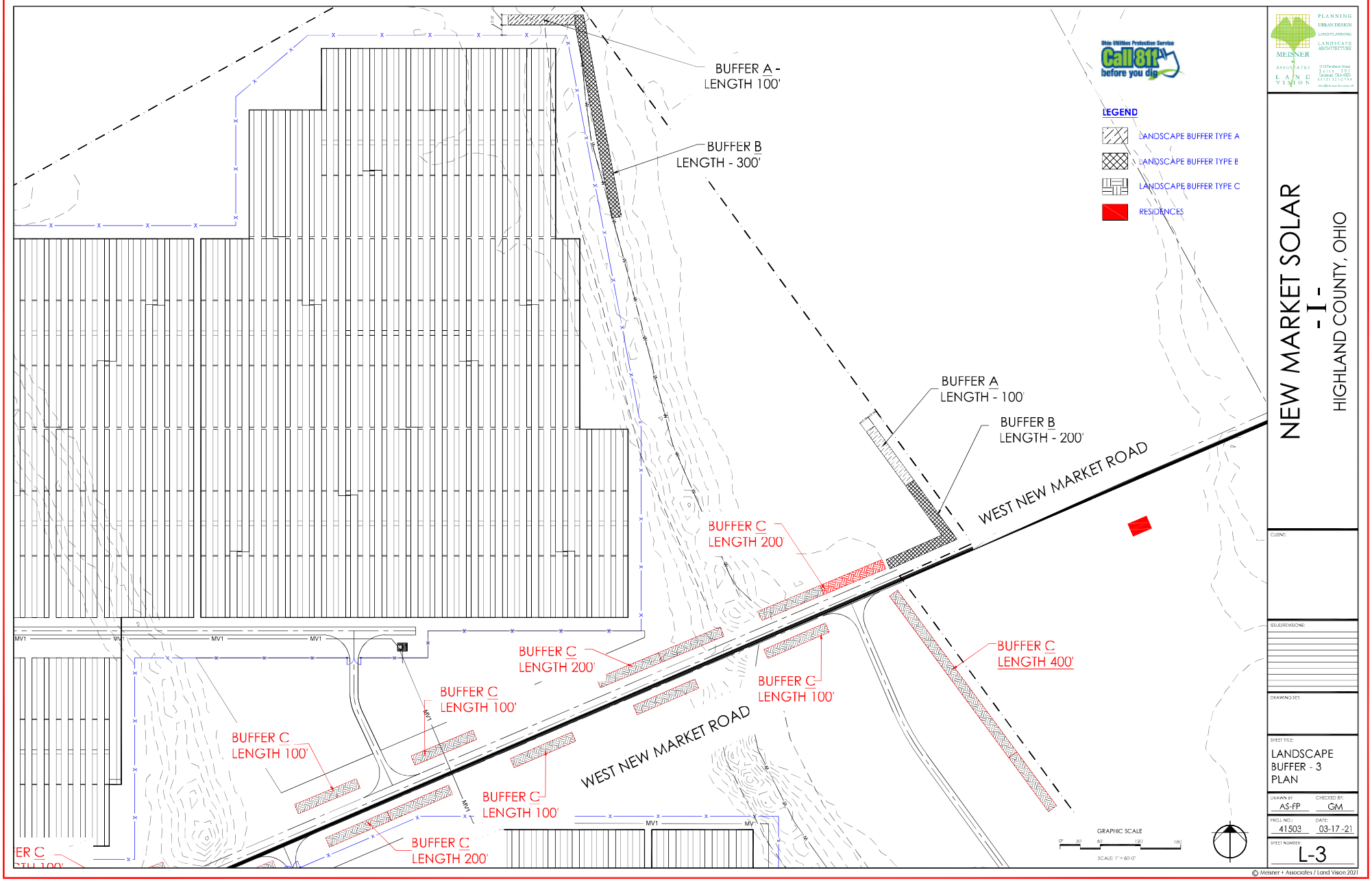

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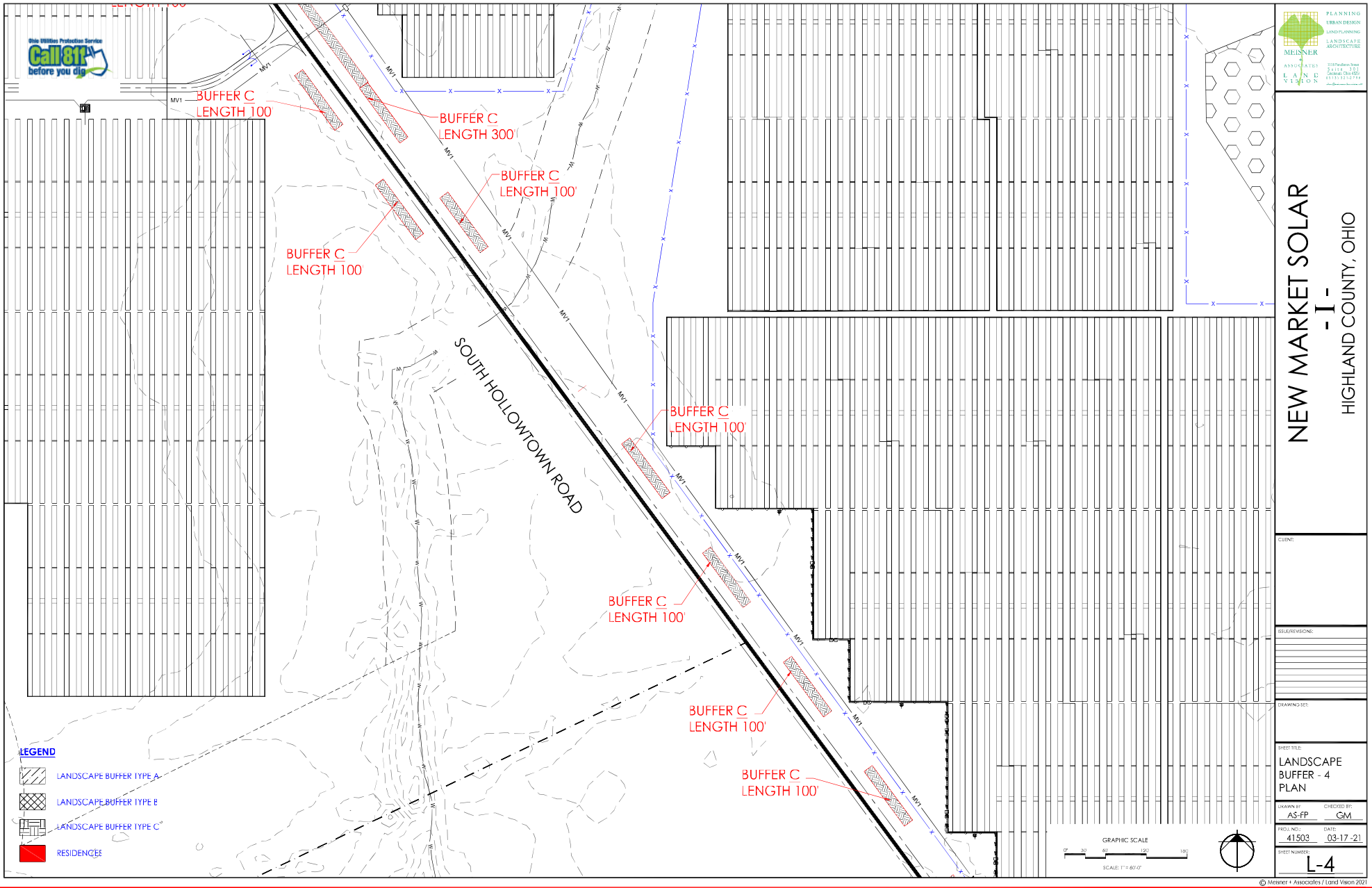

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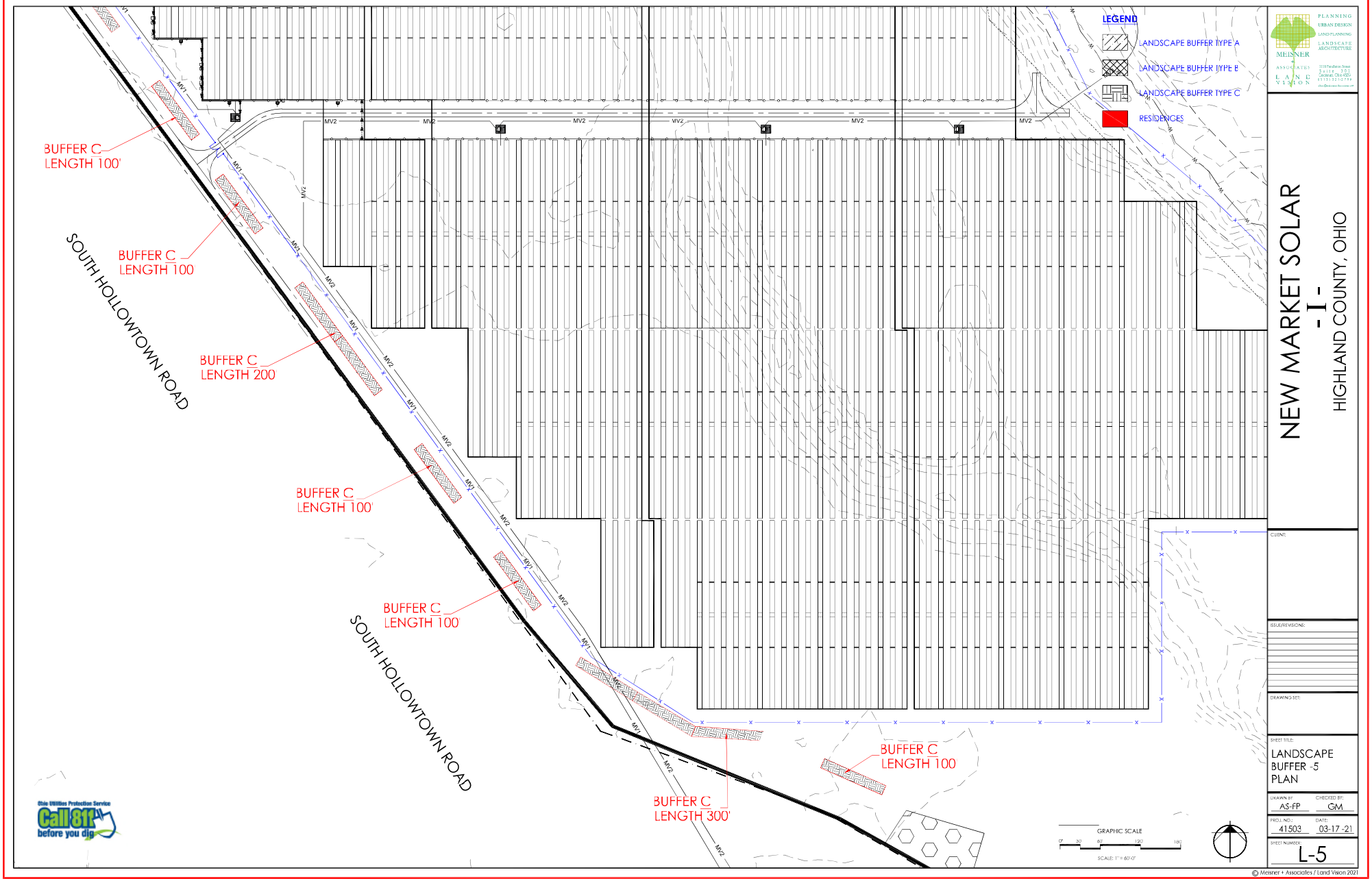

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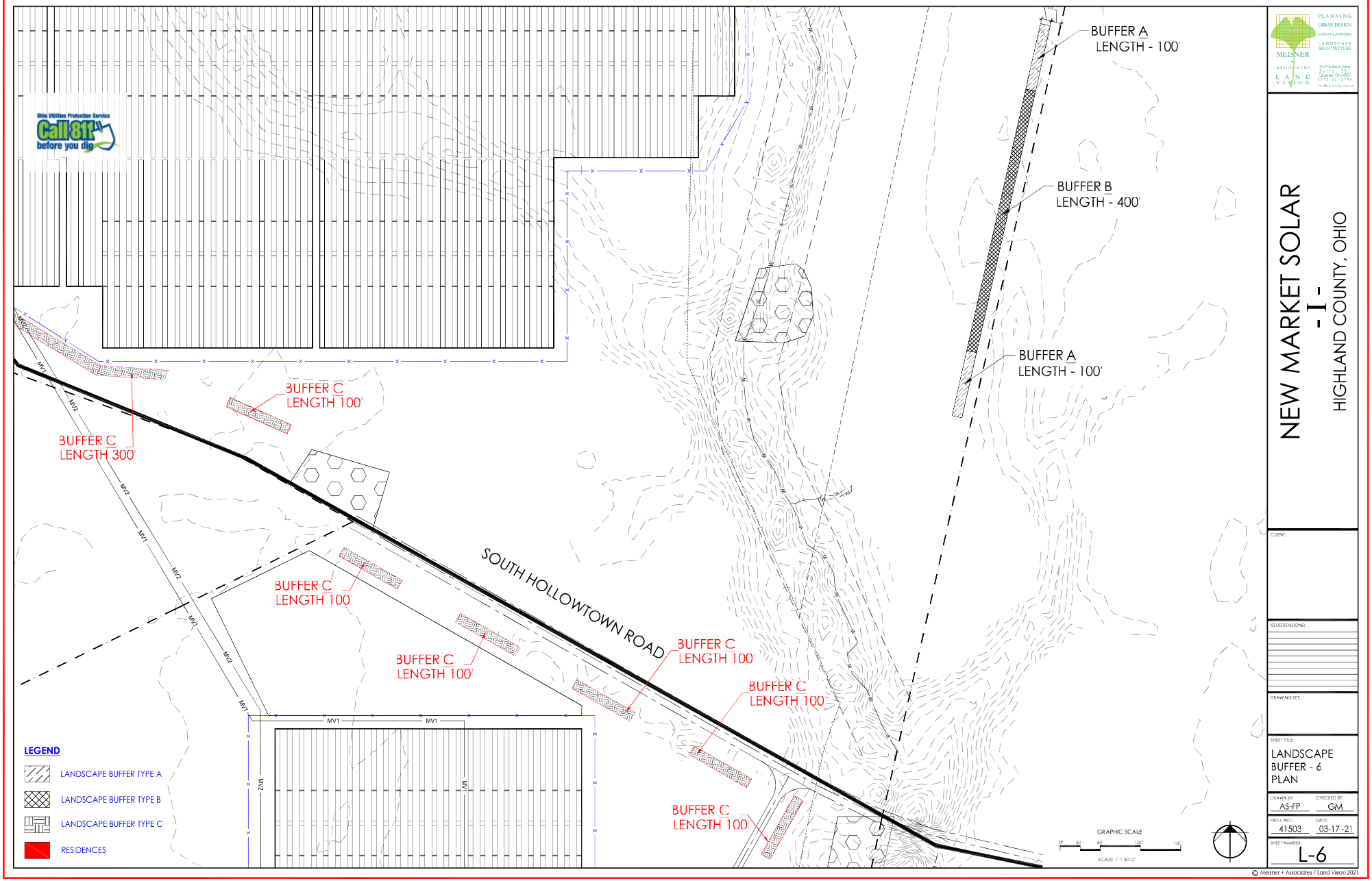

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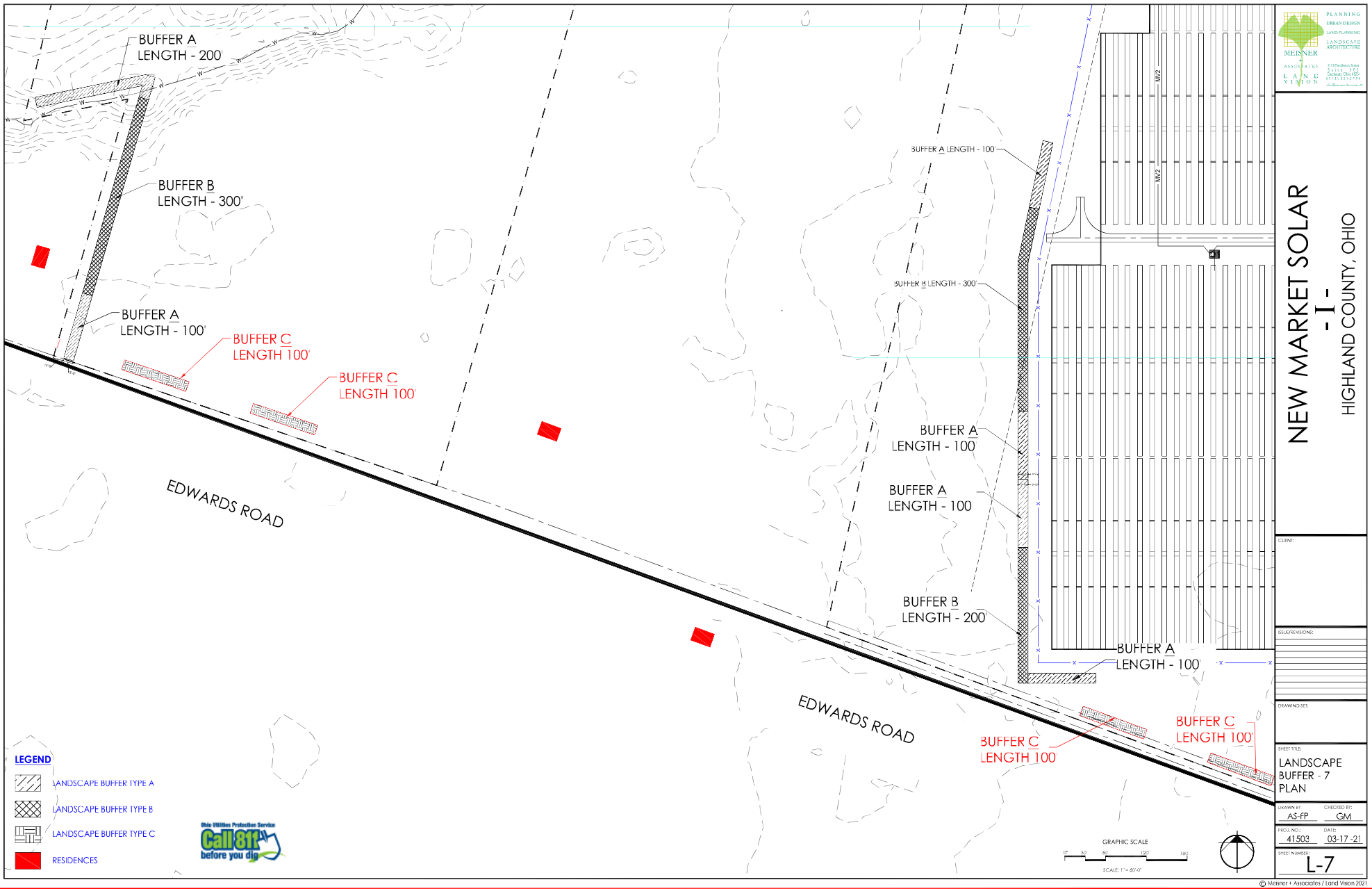

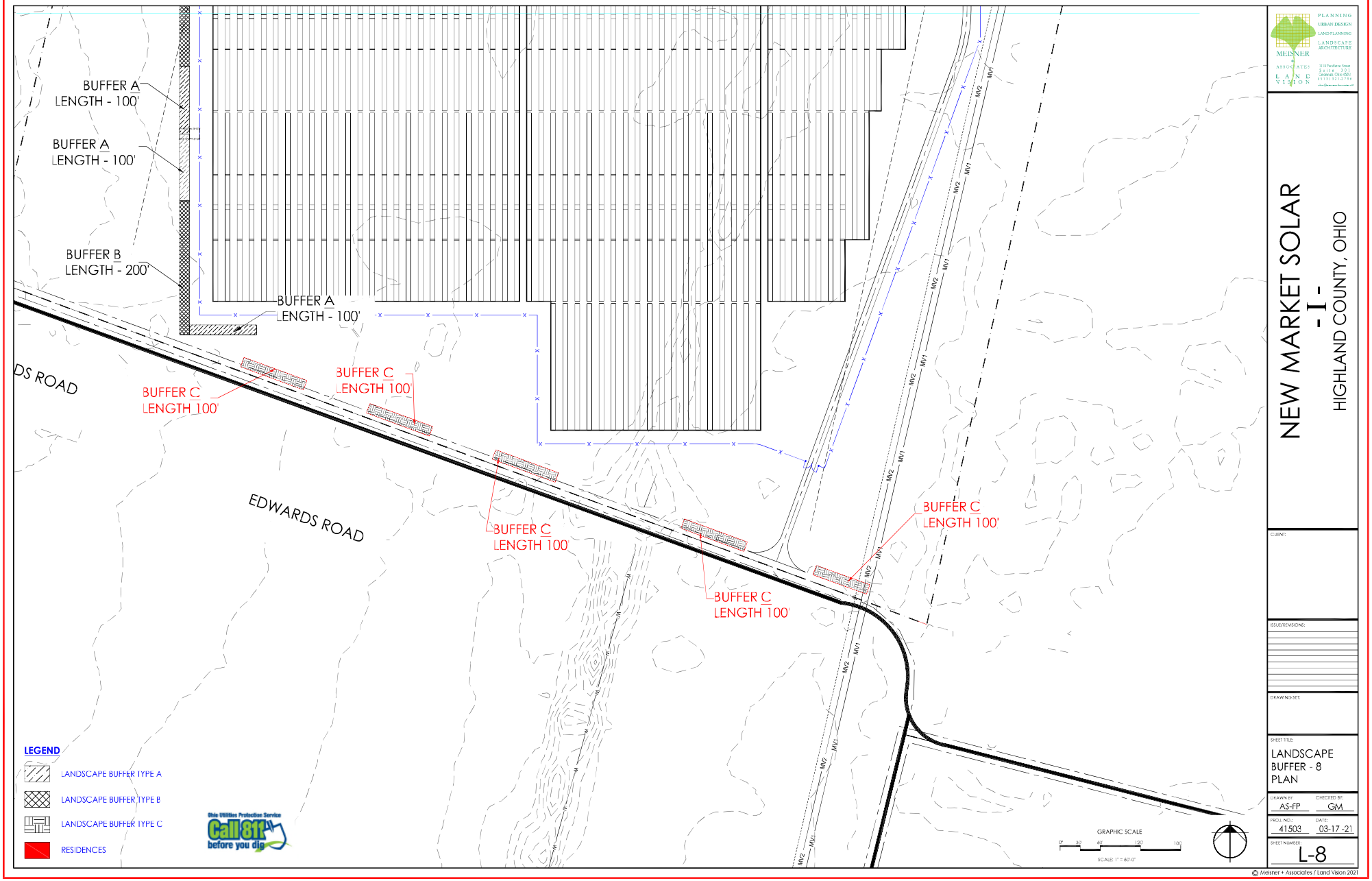

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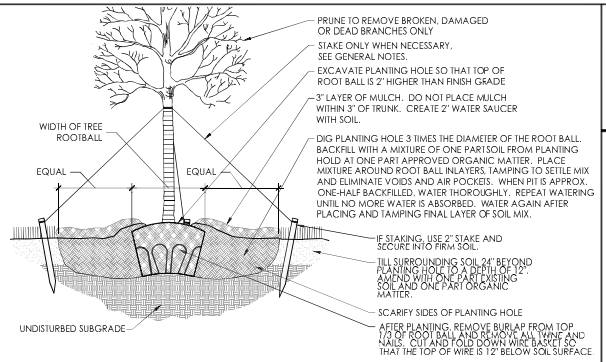
DATE: 03-17-21
SHEET NUMBER: L-8

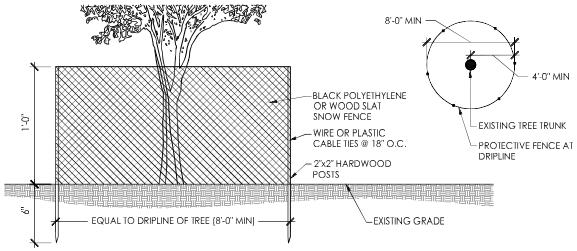
HECATE ENERGY - NEW MARKET I PLANT SCHEDULE

Key	Scientific Name	Common Name	Size	Root	Quantity	Spacing	Remarks
Deciduous Trees							
AA	*Amelanchier arborea*	Downy Serviceberry	8' Ht	B&B	36	See Plan	Clump - Specimen
CC	*Cercis canadensis*	Eastern Redbud	8' Ht	B&B	108	See Plan	Clump - Specimen
CCI	*Crategus crus-galli 'Inermis'*	Cockspur Hawthorne	6' Ht	B&B	297	See Plan	Clump - Specimen
Evergreen Trees							
TO	*Thuja occidentalis*	Northern White Cedar	8' Ht	B&B	171	See Plan	Unsheared - Specimen
PV	*Pinus virginiana*	Virginia Pine	8' Ht	B&B	558	See Plan	Unsheared - Specimen
Deciduous Shrubs							
VD	*Viburnum dentatum*	Arrowwood Viburnum	4' Ht	#5 cont.	108	See Plan	Full - Specimen
CR	*Cornus racemosa*	Gray Dogwood	3' Ht	#5 cont.	81	See Plan	Full - Specimen
CS	*Cornus sericea*	Redosier Dogwood	3' Ht	#5 cont.	72	See Plan	Full - Specimen
IV	*Ilex verticillata*	Winterberry	30" W	#5 cont.	108	See Plan	Full - Specimen
Semi Evergreen Shrubs							
MP	*Myrica pensylvanica*	Northern Bayberry	4' Ht	B&B	198	See Plan	Full - Specimen
Perennials							
RF	*Rudbeckia fulgida var. sullivantii*	Sullivant's Coneflower	24"	#3 cont.	1,242	See Plan	Full - Well Rooted
Ornamental Grasses							
AG	*Andropogon gerardii*	Big Bluestem	24"	#5 cont.	144	See Plan	Full - Well Rooted

NOTE: THESE ARE QUANTITIES PROVIDED FOR THE CONTRACTORS CONVENIENCE. THE CONTRACTOR SHALL INDEPENDENTLY CONFIRM ALL QUANTITIES FROM THE LANDSCAPE PLAN.

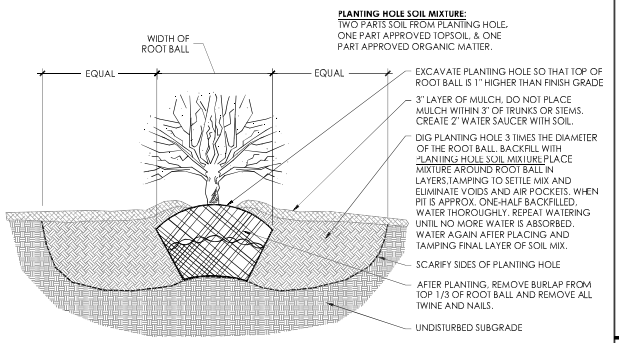


1 PLANTING DETAIL : BALLED AND BURLAPPED TREE
Scale: N.T.S.



NOTES:
1) PROTECTIVE FENCE TO REMAIN UNTIL CONSTRUCTION IS COMPLETE.
2) NO TREE SHALL BE REMOVED UNLESS SPECIFICALLY TAGGED FOR REMOVAL BY LANDSCAPE ARCHITECT.
3) CONTRACTOR SHALL TAKE CARE TO NOT TO DAMAGE TREES THAT ARE TO REMAIN.
4) ANY EXCAVATING WITHIN DRIPLINE MUST BE APPROVED BY LANDSCAPE ARCHITECT AND MUST BE HAND DUG.
5) CONTRACTOR SHALL NOT CUT ANY ROOTS AND/OR BRANCHES UNLESS APPROVED BY LANDSCAPE ARCHITECT.
6) STOCKPILED MATERIALS OR UNNECESSARY VEHICULAR TRAFFIC SHALL NOT BE ALLOWED OVER ANY TREE ROOT SYSTEM.
7) ALL EXPOSED ROOT STUBS AND ROOT ARE TO BE BACK FILLED WITH APPROVED TOPSOIL.
8) INSPECT FENCE ON WEEKLY BASIS AND REPAIR DAMAGE IMMEDIATELY.

4 PLANTING DETAIL : TREE PROTECTION FENCE
Scale: N.T.S.



2 PLANTING DETAIL : BALLED AND BURLAPPED SHRUB
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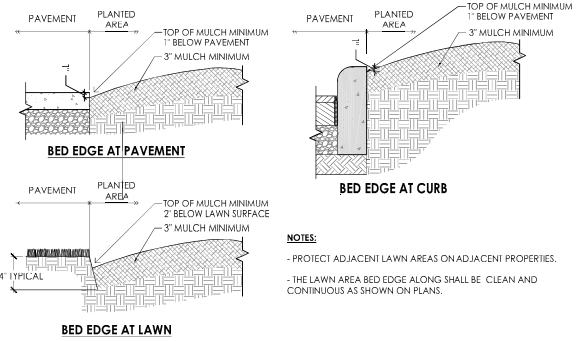
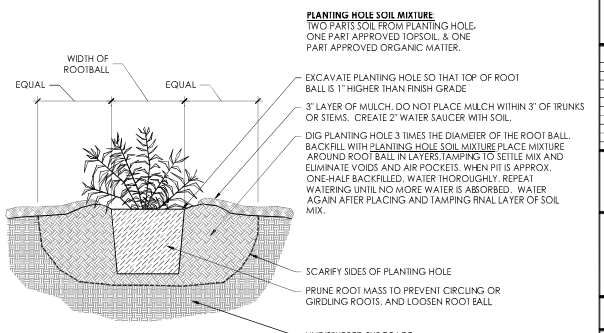


NOTES:
- PROTECT ADJACENT LAWN AREAS ON ADJACENT PROPERTIES.
- THE LAWN AREA BED EDGE ALONG SHALL BE CLEAN AND CONTINUOUS AS SHOWN ON PLANS.

5 PLANTING DETAIL : BED EDGE
Scale: N.T.S.



3 PLANTING DETAIL : CONTAINERIZED PLANTS
Scale: N.T.S.

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NEW MARKET SOLAR -I-
HIGHLAND COUNTY, OHIO

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PLANTING DETAILS & PLANT LIST SHEET

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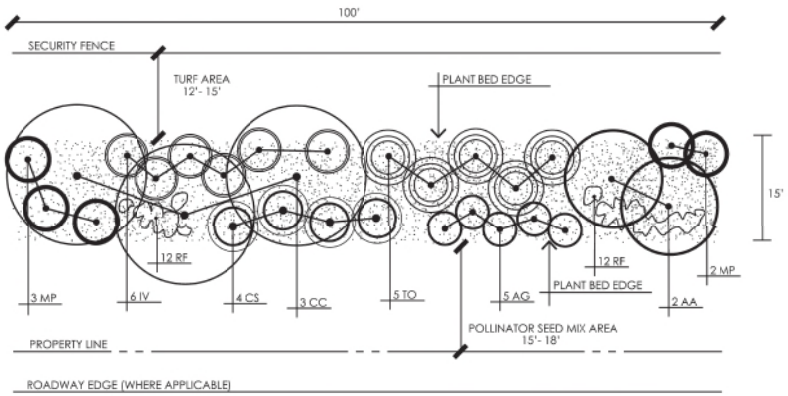
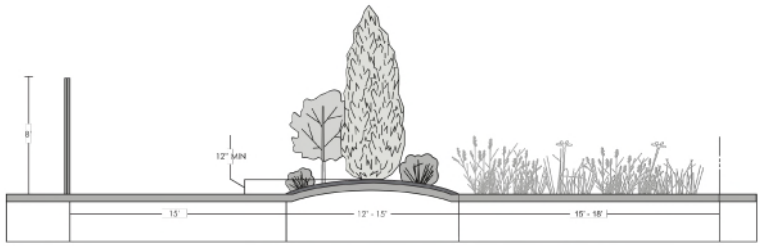
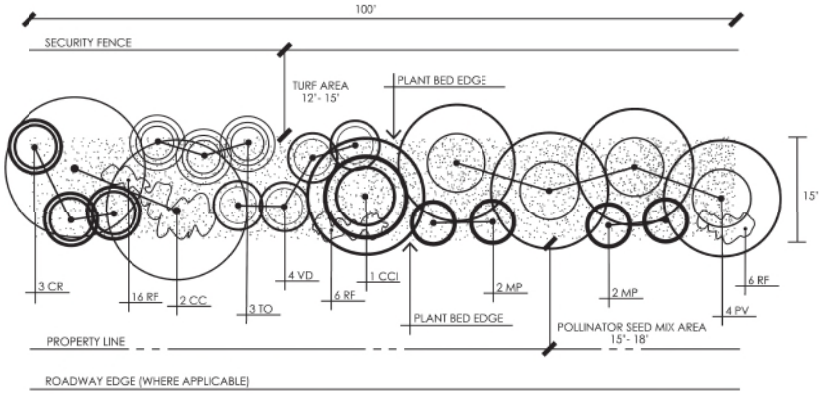
SHEET NUMBER: L-9



TYPICAL PLANT BUFFER A



TYPICAL BUFFER LANDSCAPE
CROSS SECTION



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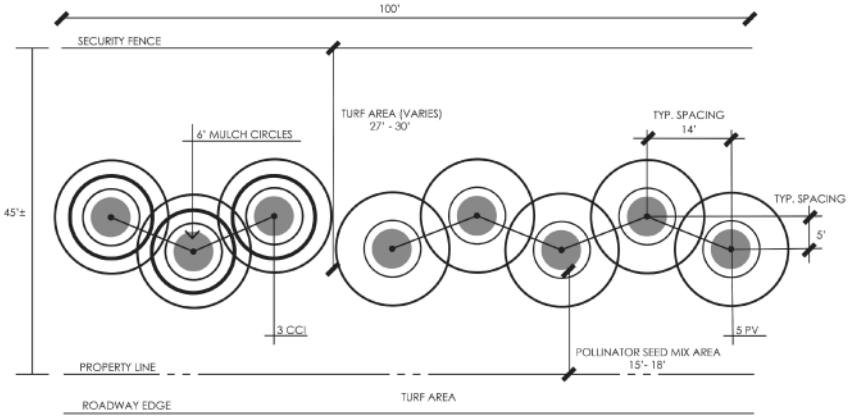

TYPICAL PLANT BUFFER C

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41503	03-03-21

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L-10

1.0 GENERAL NOTES

1.1 THIS PLAN IS FOR PLANTING ONLY.

1.2 THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS, AND NOTIFY MISS UTILITY OR EQUIVALENT UTILITY COMPANY. IN ADDITION, THE CONTRACTOR IS TO BE NOTIFIED WHICH UTILITIES, INCLUDING STORM AND SANITARY SEWERS, ARE LOCATED IN THE VICINITY OF THE PROPOSED WORK. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING AND STAKING THE LOCATION OF ALL EXISTING UTILITIES AND PROTECTING THEM DURING THE WORK AND SHALL BEAR ANY COSTS TO REPAIR UTILITIES DAMAGED AS A CONSEQUENCE OF HIS WORK.

1.3 ALL WORK SHALL MEET OR EXCEED THE REQUIREMENTS OF ALL-APPLICABLE FEDERAL, STATE AND LOCAL LAWS, ORDINANCES AND REQUIREMENTS.

1.4 ALL APPLICABLE ODOT SPECIFICATIONS SHALL BE FOLLOWED FOR THIS WORK. THE CURRENT ODOT SPECIFICATIONS ARE AVAILABLE AT - http://www.dot.state.oh.us/Divisions/Engineering/Roadway/DesignStandards/Pages/default.aspx

1.5 PROVIDE QUANTITY, SIZE, GENUS, SPECIES, AND VARIETY OF EXTERIOR PLANTS INDICATED, COMPLYING WITH APPLICABLE REQUIREMENTS IN ANSI Z60.1, "AMERICAN STANDARD FOR NURSERY STOCK." CURRENT EDITION. THE CURRENT STANDARD IS AVAILABLE AT https://www.americanhort.org/page/standards

1.6 PROVIDE WELL-SHAPED, FULLY BRANCHED, HEALTHY, VIGOROUS STOCK, FREE OF DISEASE, INSECTS, EGGS, LARVAE, AND DEFECTS SUCH AS KNOTS, SUN SCALD, INJURIES, ABRASIONS, AND DISFIGUREMENT.

1.7 TREES AND SHRUBS OF A LARGER SIZE MAY BE USED, IF ACCEPTABLE TO LANDSCAPE ARCHITECT, WITH A PROPORTIONATE INCREASE IN SIZE OF ROOTS OR BALLS.

1.8 SELECT PLANT MATERIALS FOR UNIFORM HEIGHT AND SPREAD

1.9 LABEL AT LEAST ONE TREE AND ONE SHRUB OF EACH VARIETY AND CALIPER WITH A SECURELY ATTACHED, WATERPROOF TAG BEARING LEGIBLE DESIGNATION OF BOTANICAL AND COMMON NAME.

1.10 LANDSCAPE ARCHITECT MAY OBSERVE TREES AND SHRUBS EITHER AT THE NURSERY OR AT SITE BEFORE PLANTING FOR COMPLIANCE WITH REQUIREMENTS FOR GENUS, SPECIES, VARIETY, SIZE, AND QUALITY. LANDSCAPE ARCHITECT RETAINS RIGHT TO OBSERVE TREES AND SHRUBS FURTHER FOR SIZE AND CONDITION OF BALLS AND ROOT SYSTEMS, PRESENCE OF INSECTS, INJURIES, AND LATENT DEFECTS AND TO REJECT UNSATISFACTORY, OR DEFECTIVE MATERIAL AT ANY TIME DURING PROGRESS OF WORK. REJECTED TREES & SHRUBS SHALL TAGGED AND IMMEDIATELY REMOVED FROM PROJECT SITE.

1.11 HERBICIDE TREATMENT: APPLY HERBICIDE TO PLANT BEDS ACCORDING TO MANUFACTURER'S RECOMMENDED RATES AND WRITTEN APPLICATION INSTRUCTIONS. APPLY TO DRY, PREPARED SUBGRADE OR SURFACE OF COMPACTED-AGGREGATE BASE BEFORE APPLYING PAVING MATERIALS. THE HERBICIDE MUST BE APPLIED BY A LICENSED COMMERCIAL HERBICIDE APPLICATOR ONLY

2.0 PROTECTION OF EXISTING TREES

2.1 IF EXCAVATION IS REQUIRED WITHIN DRIP LINE OF TREE, HAND CLEAR AND EXCAVATE TO MINIMIZE DAMAGE TO ROOT SYSTEMS. USE NARROW-TINE SPADING FORKS AND COMB SOIL TO EXPOSE CLEANLY CUT ROOTS.

2.2 PRESERVE EXISTING TREE ROOTS IN BACKFILL AREAS WHERE POSSIBLE. IF LARGE, MAIN LATERAL ROOTS ARE ENCOUNTERED, EXPOSE ROOTS BEYOND EXCAVATION LIMITS AS REQUIRED TO BEND AND RELOCATE THEM WITHOUT BREAKING. IF ENCOUNTERED IMMEDIATELY ADJACENT TO LOCATION OF NEW CONSTRUCTION AND RELOCATION IS NOT PRACTICAL, CLEANLY CUT ROOTS APPROXIMATELY 3 INCHES BACK FROM NEW CONSTRUCTION.

2.3 DO NOT ALLOW EXPOSED ROOTS TO DRY BEFORE PLACING PERMANENT BACKFILL. PROVIDE TEMPORARY EARTH COVER, OR PACK WITH PEAT MOSS AND WRAP WITH BURLAP AND WATER AND MAINTAIN IN A MOIST CONDITION. TEMPORARILY SUPPORT AND PROTECT ROOTS FROM DAMAGE UNIT THEY ARE PERMANENTLY RELOCATED AND COVERED WITH SOIL.

3.0 PREPARATION AND PLANTING

3.1 PROTECT STRUCTURES, UTILITIES, SIDEWALKS, PAVEMENTS, AND OTHER FACILITIES, AND LAWNS AND EXISTING EXTERIOR PLANTS FROM DAMAGE CAUSED BY PLANTING OPERATIONS.

3.2 IT IS THE CONTRACTOR'S RESPONSIBILITY TO:
- KEEP ADJACENT PAVING AND CONSTRUCTION CLEAN, AND MAINTAIN WORK AREA IN AN ORDERLY CONDITION, FOR DURATION OF PROJECT.

3.3 IT IS THE CONTRACTOR'S RESPONSIBILITY TO:
- PROTECT EXTERIOR PLANTS FROM DAMAGE DUE TO LANDSCAPE OPERATIONS, OPERATIONS BY OTHER CONTRACTORS AND TRADES, AND OTHERS. MAINTAIN PROTECTION DURING INSTALLATION AND MAINTENANCE PERIODS. TREAT, REPAIR, OR REPLACE DAMAGED EXTERIOR PLANTING.

3.4 IT IS THE CONTRACTOR'S RESPONSIBILITY TO:
- REMOVE SURPLUS SOIL AND WASTE MATERIAL , INCLUDING EXCESS SUBSOIL.

3.5 PROVIDE EROSION-CONTROL MEASURES TO PREVENT EROSION OR DISPLACEMENT OF SOILS AND DISCHARGE OF SOIL-BEARING RUNOFF OR AIRBORNE DUST TO ADJACENT PROPERTIES AND WALKWAYS.

3.6 LAY OUT INDIVIDUAL TREE AND SHRUB LOCATIONS AND AREAS FOR MULTIPLE EXTERIOR PLANTINGS. STAKE LOCATIONS, OUTLINE AREAS, ADJUST LOCATIONS WHEN REQUESTED, AND OBTAIN LANDSCAPE ARCHITECT'S ACCEPTANCE OF LAYOUT PRIOR TO PLANTING.

3.7 IT IS THE CONTRACTOR'S OPTION TO STAKE ALL TREES.

3.8 CONTRACTOR TO FOLLOW ODOT CONSTRUCTION AND MATERIAL SPECIFICATIONS MANUAL. CAREFULLY REVIEW ITEM 661 FOR PLANTING TREES, SHRUBS & VINES AND ITEM 662 FOR LANDSCAPE WATERING.

3.9 ALL PLANTING BEDS ARE TO BE PREPARED AS FOLLOWS :
- LOOSEN SUBGRADE TO A MINIMUM DEPTH OF 6". REMOVE STONES LARGER THAN 1" IN ANY DIMENSION AND STICKS, ROOTS, RUBBISH, AND OTHER EXTRANEOUS MATTER, AND LEGALLY DISPOSE OF THEM OFF OWNER'S PROPERTY.

- SPREAD COMPOST AT A MINIMUM DEPTH OF 6" AND TILL WITH LOOSENED SUBGRADE , MIXING THOROUGHLY.

- GRADE PLANTING BEDS TO A SMOOTH, UNIFORM SURFACE PLANE WITH UNCOMPACTED AND UNIFORMLY FINE TEXTURE. ROLL AND RAKE, REMOVE RIDGES, AND FILL DEPRESSIONS TO MEET FINISH GRADES.

- EDGE BEDS 3 - 4" DEEP (SEE DETAIL). NOTIFY LANDSCAPE ARCHITECT IF SUBSOIL CONDITIONS SHOW EVIDENCE OF UNEXPECTED WATER SEEPAGE OR RETENTION IN TREE OR SHRUB PITS.

3.10 COMPOST SHALL BE WELL-ROTTED MANURE AND WEED-FREE ORGANIC MATTER, pH RANGE OF 5.5 TO 8; MOISTURE CONTENT 35 TO 55 PERCENT BY WEIGHT; 100 PERCENT PASSING THROUGH ONE INCH SIEVE; SOLUBLE SALT CONTENT OF 5 TO 10 DECISIEMENS; NOT EXCEEDING 0.5 PERCENT INERT CONTAMINANTS AND FREE OF SUBSTANCES TOXIC TO PLANTINGS.

3.11 TOPSOIL SHALL BE ASTM D 5268, pH RANGE OF 5.5 TO 7, A MINIMUM OF 40 PERCENT ORGANIC MATERIAL CONTENT; FREE OF STONES 1 INCH OR LARGER IN ANY DIMENSION AND OTHER EXTRANEOUS MATERIALS HARMFUL TO PLANT GROWTH.

3.12 AMENDED TOPSOIL IS A MIXTURE OF ONE PART SOIL FROM THE PLANTING HOLE AND ONE PART APPROVED ORGANIC MATTER

3.13 ALL PLANTS SHALL BE FERTILIZED WITH 10:10:10 SLOW- RELEASE FERTILIZER PER MANUFACTURER'S WRITTEN INSTRUCTIONS.

3.14 REFER TO TYPICAL PLANTING DETAILS FOR PLANT INSTALLATION.

3.15 ALL PLANT MATERIALS, PRUNE TO REMOVE DEAD OR INJURED BRANCHES.

3.16 IT IS THE CONTRACTOR'S RESPONSIBILITY TO: INSPECT MATERIALS (SOILS, PLANTS, TOOLS) FOR PESTS AND INVASIVE SPECIES PRIOR TO WORK. FLAG PROBLEM MATERIAL AND KEEP AWAY FROM CLEARED MATERIAL, WITH APPROPRIATE LINING TO AVOID SPREAD.

4.0 SEEDING

4.1 CONTRACTOR TO FOLLOW ODOT CONSTRUCTION AND MATERIAL SPECIFICATIONS MANUAL, ITEM 659 FOR TURF SEEDING

4.2 CONTRACTOR TO FOLLOW ODOT CONSTRUCTION AND MATERIAL SPECIFICATIONS MANUAL, TABLE 659.09-1, ROADSIDE MIXTURE 2 FOR RESEEDING DISTURBED AREAS:
KENTUCKY BLUEGRASS (POA PRATENSIS) - 1.5 lb/1000 sq. ft.
KENTUCKY 31 FESCUE (FESTUCA ARUNDINACEA var. KY 31) - 2 lb/1000 sq. ft.
PERENNIAL RYEGRASS (LOLIUM PERENNE) - 1.5 lb/1000 sq. ft.

4.3 SEED ALL DISTURBED AREAS. THE FINAL GRADE AND TOPSOIL WITHIN +/- .10 FEET WILL BE IN PLACE FOR SEEDING CONTRACTOR.

4.4 APPLY A HIGH PHOSPHORUS FERTILIZER AT THE RATE OF 2-3 LB PER 1000 SF. TILL AREA TO BE SEEDED TO A DEPTH OF 4". RAKE TILLED AREA TO REMOVE DEBRIS 1" OR LARGER IN SIZE THAT HAS BEEN BROUGHT TO THE SURFACE DURING TILLING.

4.5 RAKE SEED LIGHTLY INTO TOP OF TOPSOIL, ROLL LIGHTLY, AND WATER WITH FINE SPRAY.

4.6 PROTECT SEEDED AREAS WITH SLOPES EXCEEDING 1:6 WITH TYPE "I" TEMPORARY EROSION-CONTROL MAT ODOT ITEM 712.11-I.

5.0 MULCH

5.1 MULCH SHALL BE FREE FROM DELETERIOUS MATERIALS AND SUITABLE AS A TOP DRESSING OF TREES AND SHRUBS.

5.2 CONTRACTOR SHALL USE EVANS DARK SUPREME MULCH (TWICE SHREDDED AND PROCESSED HARDWOOD MULCH, VERY DARK BROWN COLOR) OR APPROVED EQUAL FOR MULCHING.

5.3 ALL LANDSCAPE AREAS WITH TREES & SHRUBS SHALL HAVE A 3" THICK BED OF MULCH AND ALL LANDSCAPE BEDS WITH GRASSES & PERENNIALS SHALL HAVE 1 1/2" THICK BED OF MULCH APPLIED. APPLY PRE-EMERGENT HERBICIDE BEFORE MULCHING PER MANUFACTURER'S WRITTEN INSTRUCTIONS.

6.0 WARRANTY: 1 YEAR PERIOD

6.1 CONTRACTOR SHALL PROVIDE OWNER WITH A ONE YEAR WARRANTY FOR LABOR AND MATERIALS.

6.2 CONTRACTOR SHALL WARRANT EXTERIOR PLANTS AGAINST DEFECTS, INCLUDING DEATH AND UNSATISFACTORY GROWTH, EXCEPT FOR DEFECTS RESULTING FROM LACK OF ADEQUATE MAINTENANCE, NEGLECT OR INSTALLATION ABUSE BY OWNER, OR ACT OF GOD.

6.3 SERVICES PROVIDED BY WARRANTY SHALL INCLUDE :
- MAINTAINING UPRIGHT POSITION OF EXTERIOR PLANTINGS DURING WARRANTY PERIOD.

- IMMEDIATE REMOVAL OF DEAD EXTERIOR PLANTS AND IMMEDIATE REPLACEMENT, UNLESS REQUIRED TO PLANT IN THE SUCCEEDING PLANTING SEASON.

- REPLACEMENT OF PLANTS THAT ARE INSTALLED DEAD OR IN UNHEALTHY CONDITION AT END OF WARRANTY PERIOD.

6.4 WARRANTY SHALL BE LIMITED TO ONE REPLACEMENT OF EACH EXTERIOR PLANT, EXCEPT FOR LOSSES OR REPLACEMENTS DUE TO FAILURE OF CONTRACTOR TO COMPLY WITH REQUIREMENTS DURING LANDSCAPE MAINTENANCE PERIOD.

6.5 THE LANDSCAPE CONTRACTOR SHALL PROVIDE FULL MAINTENANCE OF NEW PLANTS, TURF AREAS, BEDS AND EXISTING PLANTS WITHIN NEW PLANT BEDS BEGINNING WITH INITIATION OF WORK ON-SITE FOLLOWING ISSUANCE OF A NOTICE TO PROCEED, AND CONTINUING FOR THE FULL MAINTENANCE PERIOD - A MINIMUM OF 60 DAYS FOLLOWING PRELIMINARY ACCEPTANCE OF THE WORK.

6.6 A PRELIMINARY ACCEPTANCE INSPECTION WILL BE PERFORMED AT THE CONCLUSION OF INSTALLATION WORK BY THE LANDSCAPE ARCHITECT. THIS MAINTENANCE WORK SHALL INCLUDE PERIODIC WATERING, WEEDING, HERBICIDE APPLICATION, PRUNING, AND INSECT/DISEASE CONTROL. SHOULD PLANTS DIE DURING THIS PERIOD THEY SHALL BE REPLACED DURING THE DORMANT SEASON OF EITHER LATE FALL OR EARLY SPRING WITH IDENTICAL SPECIFIED PLANT MATERIAL AT NO ADDITIONAL COST TO THE OWNER .

7.0 LANDSCAPE MAINTENANCE: 1 YEAR PERIOD 2 YEAR PERIOD (OPTIONAL)

7.1 THE LANDSCAPE CONTRACTOR SHALL PROVIDE FULL MAINTENANCE OF NEW PLANTS, TURF AREAS, BEDS AND EXISTING PLANTS WITHIN NEW PLANT BEDS BEGINNING WITH INITIATION OF WORK ON-SITE FOLLOWING ISSUANCE OF A NOTICE TO PROCEED, AND CONTINUING UNTIL 1 CALENDAR YEAR FOLLOWING PRELIMINARY ACCEPTANCE OF THE WORK.

7.2 A PRELIMINARY ACCEPTANCE INSPECTION WILL BE PERFORMED AT THE CONCLUSION OF INSTALLATION WORK BY THE LANDSCAPE ARCHITECT. THIS MAINTENANCE WORK SHALL INCLUDE WATERING, WEEDING, HERBICIDE APPLICATION, PRUNING, AND INSECT/DISEASE CONTROL. SHOULD PLANTS DIE DURING THIS PERIOD THEY SHALL BE REPLACED DURING THE DORMANT SEASON OF EITHER LATE FALL OR EARLY SPRING WITH IDENTICAL SPECIFIED PLANT MATERIAL AT NO ADDITIONAL COST TO THE OWNER.

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NEW MARKET SOLAR -I-

HIGHLAND COUNTY, OHIO

CLIENT:

ISSUE/REVISIONS:

DRAWING SET:

SHEET TITLE:
LANDSCAPE NOTES SHEET

DRAWN BY: AS
CHECKED BY: GM
PROJ. NO.: 41503
DATE: 03-17-21
SHEET NUMBER: L-11

DASHIELL CORP.

A QUANTA SERVICES COMPANY

Outdoor Illumination Study

New Market Solar
345-34.5kV Substation
Dashiell Project No. 703777A

Rev. B – Revised Design Input – 03/11/21
Rev. A – Issued for Review – 02/22/21

DASHIELL ENGINEERS CONSTRUCTORS www.dashiellcorp.com

New Market Solar
345-34.5kV Substation
Outdoor Illumination Study

DRAWN J. Herget CHK'D J. Herget APP'D. A. Taylor DATE 02/22/21	DWG. NO. 703777A-DE4-06030 SH. 1 OF 5	REV. B

Table of Contents

Rev. B – Revised Design Input - 03/11/21
Rev. A – Issued for Review – 02/22/21

DASHIELL
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New Market Solar
345-34.5kV Substation
Outdoor Illumination Study

DRAWN	J. Herget	DWG. NO.	REV.
CHK'D	J. Herget	703777A-DE4-06030	B
APP'D.	A. Taylor	SH. 2 OF 5	
DATE	02/22/2		

1. Scope

The purpose of this calculation is to determine the required yard lighting at New Market Solar 345/34.5kV collector substation.

2. Design Methodology

Section 111 of the National Electric Safety Code outlines the required illumination of a substation in "Table 111-1-Illumination levels" as seen in Figure 1. While NESC states outdoor illumination is not required at unattended stations, we will use it as a reference for the purpose of this study.

Table 111-1—Illumination levels

Location	lux	footcandles
Generating station (interior)		
Highly critical areas occupied most of the time [1]	270	25
Areas occupied most of the time [2]	160	15
Critical areas occupied infrequently [3]	110	10
Areas occupied infrequently [4]	55	5
Generating station (exterior)		
Building pedestrian main entrance	110	10
Critical areas [5]	55	5
Areas occupied occasionally by pedestrians [6]	22	2
Areas occupied occasionally by vehicles [7]	11	1
Areas occupied infrequently [8]	5.5	0.5
Remote areas [9]	2.2	0.2
Substation		
Control building interior	55	5
General exterior horizontal and equipment vertical	22	2
Remote areas [10]	2.2	0.2

Figure 1: NESC Table 111-1

3. Design Input

3.1. Lighting Software – Visual 2017.

3.2. Lights

3.2.1. Floodlights – Plusrite naturaLED Slim Area Light, 360Watt LED.

3.2.2. Wall Packs – Lumark Axcent AXCL, 102W LED

3.3. Mounting height

3.3.1. 35'-0" on static masts

3.3.2. 8'-0" on building exterior walls.

3.4. Lighting Controls

3.4.1. Floodlights are controlled via a lighting contactor installed in the substation control enclosure. The contactor is able to be switched into three (3) positions: Off, Manual, and Auto. In the Off position the lighting circuit for the substation Floodlights is disabled. In the Manual position, a light switch mounted inside the control enclosure and adjacent to the exterior doors, can be used to enable or disable the Floodlights as needed. When the lighting contactor is switched to the Auto position, the operation of the Floodlights will be controlled by a photosensor installed on the roof of the substation control enclosure.

3.4.2. Wall Packs are mounted on the exterior wall of the control enclosure, adjacent to each door, in order to illuminate each point of entry/exit. The Wall Packs are controlled via a small button photosensor installed on the housing of the light fixture. There is a light switch mounted inside the control enclosure next to each door that provides the ability to override the photosensor to enable or disable the Wall Pack light associated with that point of entry as needed.

4. Analysis

Horizontal illumination in foot-candles at ground level is shown in lighting plan embedded below.

703777A-DE0-17033
.pdf

5. Reference

5.1. The technical data sheets for each light fixture are embedded below for reference:

LED-FXSAL36050KDB3S.pdf

LA-AXCL10A-PC1.pdf

6. Conclusion

Horizontal Illuminance (foot-candle)

Average	3.5
Maximum	9.7
Minimum	0
Maximum/Minimum	NA
Average/Minimum	NA

6225 N 24th St, Suite 200, Phoenix, Arizona 85016
P 480-449-4700 | F 480-449-4747
mccarthy.com

March 18, 2021

Ohio Power Siting Board
180 E Broad St,
Columbus, OH 43215

Ohio Power Siting Board Staff,

McCarthy Building Companies (McCarthy) has developed the following Vegetation Implementation Plan to be utilized during construction of the New Market I – 65 MW Project (Project). This implementation plan was adapted from the August 2020 Vegetation Management Plan (VMP). McCarthy reviewed the original VMP and made slight adjustments to the seed mixes. These adjustments were made utilizing a scientific approach, incorporating principals of soil science, ecology, as well as practical field experience restoring post construction sites. The goal of the Vegetation Implementation Plan is to provide guidelines for the construction and restoration phases to meet requirements of the SWPPP as well as the short- and long-term goals of the Project.

To the solar array mix, the addition of nitrogen fixing legume species (white and crimson clover) is recommended. Based on McCarthy's experience revegetating disturbed sites in the region, clover species are an important component to successful revegetation as they not only germinate quickly, reducing erosion potential, but also aid in re-establishing soil health and biology through nitrogen fixation. This unique quality provides long term soil fertility and vegetative health. Additionally, both crimson and white clover are an important nectar source for pollinating insects; creating pollinator habitat is a goal for the Project.

McCarthy intends to plant the secondary pollinator seed mix, composed of primarily native species, in larger areas of the Project not occupied by arrays or other infrastructure. The location of these areas was chosen based on feasibility of implementation, wildlife value, and future maintenance. Larger areas provide greater wildlife benefit as they provide contiguous habitat, greater diversity and plant health, and reduce both predation and encroachment of undesired species. Minor modifications were made to the original proposed pollinator mix from the August 2020 VMP based on site conditions, plant adaptability, soil type, and suitability for solar sites. The tall stature grasses, Indiangrass (*Sorghastrum nutans*) and Big bluestem (*Andropogon gerardii),* although important prairie species, were not included in the amended mix as they tend to be aggressive spreaders on fertile soil, and, reaching a height of six to eight feet, would not be appropriate if naturally reseeded into the array areas. Additional flowering species were substituted into the mix based on availability, soil suitability, establishment

success on disturbed sites, as well as aesthetic and pollinator value. McCarthy's soil and vegetation specialists have made site specific modifications to the original VMP to successfully meet the goals of the Project. The attached Vegetation Implementation Plan will be utilized in the field to ensure the recommended and required revegetation and restoration steps are implemented. Please feel free to contact the below for further details and clarification.

Virginia Brown, CPSS

McCarthy Building Companies, Inc.
vbrown@mccarthy.com

Vegetation Implementation Plan

New Market Solar I – 65 MW Project

1 Clearing

Trees must be felled between October 15th and March 31st to maintain compliance with US Fish and Wildlife Service requirements. Dispose of woody debris by one or more of the following:

- Utilizing chips as perimeter stormwater BMP by constructing a low berm.
- Spreading in a layer not to exceed 1-inch depth and incorporate into the soil by disc or similar.
- Removing from the site, if necessary.

2 Topsoil

Topsoil salvage and preservation must be implemented in all areas where grading/cut-fill activities are to occur. Topsoil depth across the site range from approximately 6 to 11 inches. In areas where disturbance is planned, topsoil depths should be verified in the field prior to earthmoving to ensure sufficient topsoil is salvaged. In areas where cut-fill activities are not required, effort should be made to limit unnecessary soil disturbance outside that necessary for pile driving and construction access.

3 Seeding

Two seed mixes have been prepared for this site. The Solar Array Mix is low growing and will be planted across most of the site, including all areas within the array. The secondary Pollinator Mix should be planted in designated areas outside the array. See the attached map for NM I & II pollinator seeding locations. In all areas, seeding prior to pile driving is preferred, however, where this is not feasible, additional soil preparation and amendments may be needed based on soil properties.

Undisturbed Areas (No cut-fill or grading)

Pre-pile Seeding

Directly drill seed the appropriate seed mix using an appropriate and calibrated no till or native seed drill to a depth of ¼ to ½ inch. Drill seeding may be performed directly over existing vegetation where cover is sparse.

Disturbed Areas, Tree Clearing Areas, and Post-Construction In-Array Seeding

Prepare seedbed by:

a. Redistribute stockpiled topsoil.
b. Soil sample to determine specific fertility needs. Preliminary survey anticipates 100 lbs/ac 20-20-20 NPK fertilizer or similar.
c. Prepare seedbed by tilling 4.0 to 6.0 inches to incorporate soil amendments using a disk and harrow, field cultivator, vibra-shank, or other suitable alternative. Soil must be adequately dry to prevent compaction and rutting.
d. Drill seed as described above.
e. Apply 1.5 ton/ac straw mulch and crimp in to surface in areas with high erosion potential.

4 Weed Management

- Seeding the site prior to pile installation is a critical step to weed prevention.
- Mow during the growing season to prevent weeds from spreading and to allow the intended grass to establish.
- Re-seed areas with poor growth and apply fertilizer, based on soil test, if needed.
- Utilize herbicide only in areas where weeds were unsuccessfully controlled by mowing and reseeding.

5 Seed Mixes

Solar Array Mix			
Common Name	Scientific Name	# PLS/acre	% of Mix
Kentucky bluegrass	*Poa pratensis*	1.31	22.0%
Creeping red fescue	*Festuca rubra*	6.39	30.0%
Sheep fescue	*Festuca ovina*	3.84	20.0%
Hard fescue	*Festuca brevipila*	3.47	15.0%
Autumn bentgrass	*Agrostis perennans*	0.05	3.0%
White clover	*Trifolium repens*	1.01	6.0%
Crimson clover	*Trifolium incarnatum*	3.48	4.0%
Total	--	19.55	100.0%
Notes: Add 15 lbs Annual Ryegrass per acre to the above mix as a cover crop. # PLS= pounds Pure Live Seed, listed as drill seeding rates. Seeding applied by broadcast must be 2x the rate.			

Pollinator Mix			
Common Name	Scientific Name	# PLS/acre	% of Mix
Canada wildrye	*Elymus canadensis*	4.26	15.00%
Virginia wildrye	*Elymus virginicus*	7.29	15.00%
Sideoats grama	*Bouteloua curtipendula*	1.71	10.00%
Little bluestem	*Schizachyrium scoparium*	3.14	25.00%
Blanket flower	*Gaillardia aristata*	0.25	1.00%
Smooth penstemon	*Penstemon digitalis*	0.02	1.00%
Purple prairie clover	*Dalea purpureum*	0.14	1.00%
Golden alexanders	*Zizia aurea*	0.19	1.00%
Common milkweed	*Asclepias syriaca*	0.51	1.00%
Wild bergamot	*Monarda fistulosa*	0.03	1.00%
Partridge pea	*Chamaecrista fasciculata*	2.27	3.00%
Purple coneflower	*Echinacea purpurea*	0.62	2.00%
White clover	*Trifolium repens*	0.21	5.00%
Stiff goldenrod	*Oligoneuron rigidum*	0.05	1.00%
Lanceleaf coreopsis	*Coreopsis lanceolata*	0.30	2.00%
Black eyed susan	*rudbeckia hirta*	0.04	2.00%
Common sneezeweed	*Helenium autumnale*	0.05	2.00%
Prairie blazing star	*Liatris pycnostachya*	0.19	1.00%
Frost aster	*Symphyotrichum pilosum*	0.01	0.50%
Plains coreopsis	*coreopsis tinctitoria*	0.01	1.00%
Wild lupine	*Lupinus perennis*	0.71	0.50%
Crimson clover	*Trifolium incarnatum*	1.74	8.00%
Indian blanket	*Gaillardia pulchella*	0.14	1.00%
Total	--	23.86	100.00%
Notes: Add 15 lbs Annual Ryegrass per acre to the above mix as a cover crop. # PLS= pounds Pure Live Seed, listed as drill seeding rates. Seeding applied by broadcast must be 2x the rate.			

Figure 1 Pollinator Seeding Area, NM I

This foregoing document was electronically filed with the Public Utilities

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in

Case No(s). 20-1288-EL-BGN

Summary: Notification Compliance with Condition No. 12 (Landscape Plan) electronically filed by Ms. Karen A. Winters on behalf of Hecate Energy Highland 4 LLC