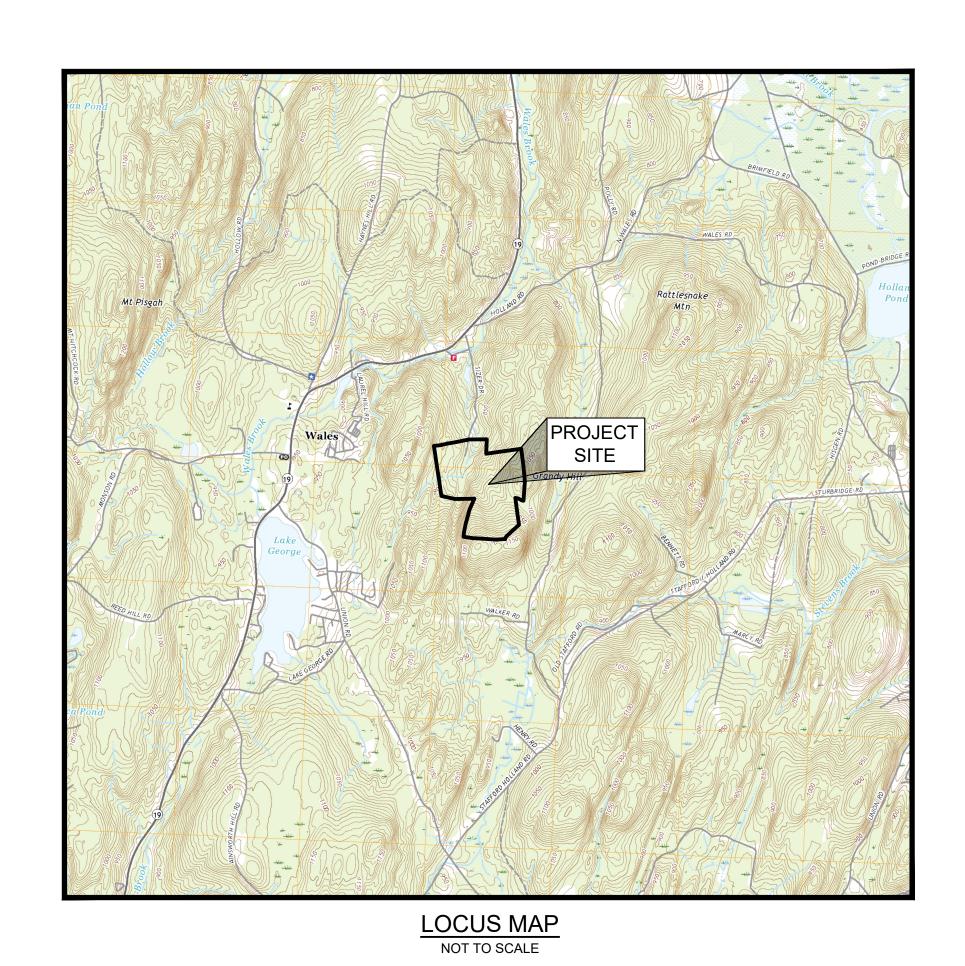
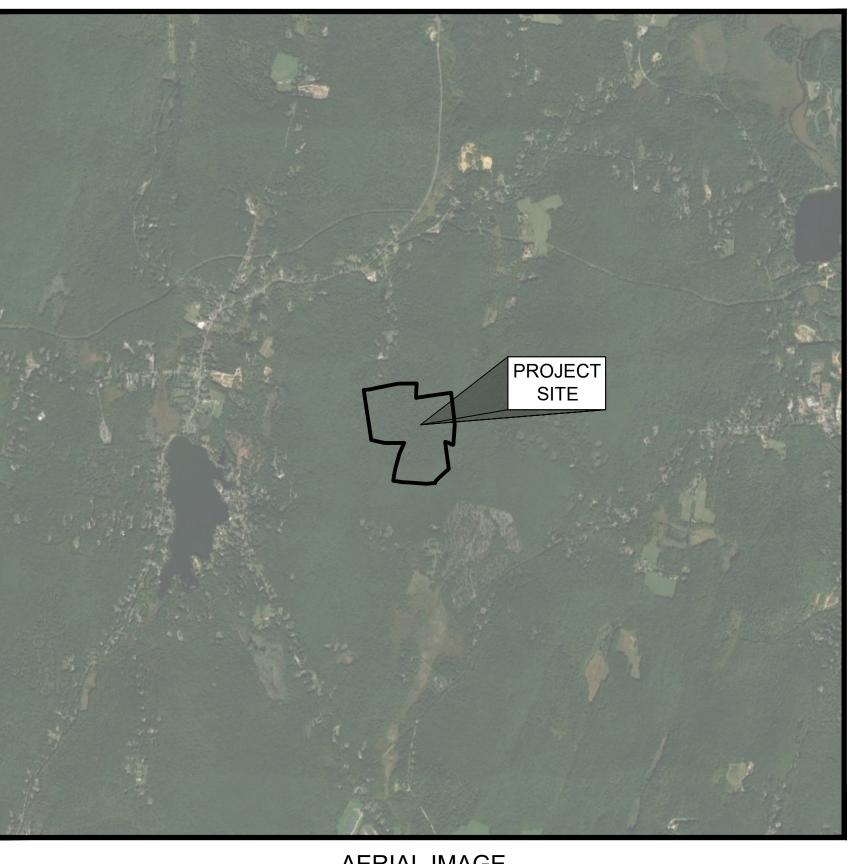
SUNPIN ENERGY SERVICES, LLC

4.493 MW DC GROUND-MOUNT SOLAR PV DEVELOPMENT 40 SIZER DRIVE WALES, MASSACHUSETTS APRIL 29, 2021 LAST REVISED JUNE 29, 2021 ISSUED FOR PERMITTING/NOT FOR CONSTRUCTION

DRAFT







AERIAL IMAGE NOT TO SCALE

DRAWING INDEX

SHEET NUMBER	DRAWING TITLE	DRAWING NUMBER
	COVER SHEET	
1	CONSTRUCTION, EROSION AND SEDIMENTATION CONTROL NOTES	G-001
2	EXISTING CONDITIONS PLAN	V-101
3	SHEET INDEX PLAN	C-101
4	PROPOSED SITE PLAN (SHEET 1 OF 2)	C-102
5	PROPOSED SITE PLAN (SHEET 2 OF 2)	C-103
6	PROPOSED GRADING AND DRAINAGE PLAN (SHEET 1 OF 2)	C-104
7	PROPOSED GRADING AND DRAINAGE PLAN (SHEET 2 OF 2)	C-105
8	STREAM/WETLAND CROSSING AREA	C-106
9	STREAM/WETLAND CROSSING NOTES AND DETAILS	C-107
10	DETAILS (SHEET 1 OF 2)	C-501
11	DETAILS (SHEET 2 OF 2)	C-502

PROPERTY OWNER

CINDY BOUCHER

40 SIZER DRIVE WALES, MASSACHUSETTS 01081

DEVELOPED BY

SUNPIN ENERGY SERVICES, LLC



12424 WILSHIRE BOULEVARD, #750 LOS ANGELES, CA 90025

PREPARED BY



WOOD MASSACHUSETTS, INC.

271 MILL ROAD CHELMSFORD, MASSACHUSETTS 01824

MATERIAL SPECIFICATIONS AND PLACEMENT REQUIREMENTS

1.1 ANGULAR ROCK FILL

NO. 200

ANGULAR ROCK FILL SHALL BE USED FOR THE CONSTRUCTION ENTRANCE AS SHOWN ON THE DRAWINGS, AND SHALL MEET THE GRADATION REQUIREMENTS LISTED BELOW.

PRIOR TO USE, THE ANGULAR ROCK FILL SHALL BE TESTED FOR APPROVAL AS DESCRIBED IN SECTION 2.0 AND SHALL BE PLACED AS DESCRIBED IN SECTION 3.0.

1.2 DENSE GRADED CRUSHED STONE

DENSE GRADED CRUSHED STONE SHALL BE USED TO CONSTRUCT THE CRUSHED STONE ACCESS ROAD, AND SHALL MEET THE REQUIREMENTS OF A MATERIAL SUCH AS MASSDOT SPECIFICATION M2.01.7 CRUSHED STONE, OR APPROVED EQUAL. THIS MATERIAL SHALL BE PLACED AT A MINIMUM THICKNESS OF 6-INCHES AND SHALL BE IN DIRECT CONTACT WITH THE BALLAST BLOCKS. THIS MATERIAL SHALL CONSIST OF CLEAN, HARD, DURABLE CRUSHED ROCK OR CRUSHED GRAVEL STONE, FREE FROM LOAM AND CLAY AND DELETERIOUS MATERIAL AND NO MORE THAN 10 PERCENT PASSING THE U.S. NO. 200 SIEVE. THIS MATERIAL SHALL MEET THE FOLLOWING GRADATION:

SIEVE DESIGNATION PERCENT PASSING 1.5-INCH 70-100 34-INCH 50-85 NO. 4 30-55 NO. 50 8-24

3-10

PRIOR TO USE, THE DENSE GRADED CRUSHED STONE SHALL BE TESTED FOR APPROVAL AS DESCRIBED BELOW IN SECTION 2.0 AND SHALL BE PLACED AS DESCRIBED BELOW IN SECTION 3.0.

1.3 GRANULAR FILL MATERIAL

NO. 200

CLEAN GRANULAR FILL MAY BE USED FOR FILL OR GRADING MATERIAL. GRANULAR FILL SHALL CONSIST OF MASSDOT MATERIAL M1.03.0, GRAVEL BORROW, TYPE C, OR APPROVED EQUAL. AND MEET THE FOLLOWING GRADATION:

½-INCH 50-85 NO. 4 40-75 NO. 50 8-28

SIEVE DESIGNATION PERCENT PASSING

PRIOR TO USE, THE GRANULAR FILL SHALL BE TESTED FOR APPROVAL AS DESCRIBED IN SECTION 2.0 AND SHALL BE PLACED AS DESCRIBED IN SECTION 3.0.

1.4 LOAM BORROW MATERIAL

THE LOAM BORROW SHALL CONFORM TO MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, DIVISION III -MATERIALS SPECIFICATIONS, SECTION M1.05.0 "LOAM BORROW". THE LOAM SHALL CONTAIN NOT LESS THAN 4% NOR MORE THAN 20% ORGANIC MATTER.

1.5 GEOTEXTILE FABRIC

FIBERS USED IN MANUFACTURING OF THE GEOTEXTILES SHALL CONSIST OF POLYPROPYLENE, POLYVINYL CHLORIDE, NYLON, POLYOLEFINS, POLYAMIDES, OR POLYESTER. THE FIBERS SHALL BE FORMED INTO A NETWORK SUCH THAT THE FILAMENTS OR YARNS RETAIN DIMENSIONAL STABILITY RELATIVE TO EACH OTHER, INCLUDING SELVAGES. THE GEOTEXTILE SHALL CONTAIN STABILIZERS AND/OR INHIBITORS TO MAKE THE FIBERS RESISTANT TO DETERIORATION RESULTING FROM EXPOSURE TO SUNLIGHT, WATER, OR HEAT. THE GEOTEXTILE SHALL BE FREE OF DEFECTS OR FLAWS WHICH WILL AFFECT ITS PHYSICAL PROPERTIES. PROVIDE A GEOTEXTILE MEETING THE PROPERTIES LISTED IN TABLE 1:

REQUIRED PHYSICAL PROPERTIES OF GEOTEXTILE FABRIC

PROPERTY	TEST METHOD	NON-WOVEN	WOVEN
MASS PER UNIT AREA (OZ/YD3)	D 5261	6	N/A
GRAB TENSILE STRENGTH (LBS)	D 4632	170	N/A
TENSILE STRENGTH (LBS/FT)	D 4595	N/A	7200
ELONGATION (%)	D 4632	50	N/A
PUNCTURE STRENGTH (LBS)	D 6241	435	N/A
TRAPEZOID TEAR (LBS)	D 4533	70	N/A
PERMITTIVITY (SEC ⁻¹)	D 4491	1.50	0.90
WATER FLOW RATE (GPM/FT²)	D 4491	110	65
ULTRAVIOLET STABILITY (% FOR MIN 500 HRS)	D 4355	70	80
APPARENT OPENING SIZE (AOS) (STANDARD SIEVE)	D 4751	70	20

TABLE NOTES:

1. ALL NUMERICAL VALUES EXCEPT AOS AND ULTRAVIOLET STABILITY REPRESENT MINIMUM AVERAGE ROLL VALUES (MARV), IN THE WEAKER PRINCIPAL DIRECTION.

2. AOS VALUE IS A MAXIMUM AVERAGE ROLL VALUE OR MAXARV.

3. ULTRAVIOLET STABILITY IS MEASURED AS A MINIMUM AVERAGE PERCENTAGE.

4. SEE DETAILS ON DRAWING C-501 FOR LOCATIONS OF WOVEN AND NON-WOVEN GEOTEXTILES.

2.0 BORROW SOURCE TESTING REQUIREMENTS

PRIOR TO USE, BORROW SOURCE TESTING, INCLUDING GEOTECHNICAL CHARACTERIZATION REQUIREMENTS, SHALL BE CONDUCTED ON ALL SOIL MATERIALS PROPOSED FOR CONSTRUCTION AND SUBMITTED TO THE ENGINEER TO ASSESS CONFORMANCE TO MATERIAL SPECIFICATIONS.

3.0 MATERIAL PLACEMENT AND FIELD QUALITY CONTROL REQUIREMENTS

1. FILL MATERIAL SHALL NOT BE PLACED ON SURFACES THAT ARE MUDDY, FROZEN, OR CONTAIN FROST OR ICE.

- 2. SURFACES ON WHICH THE GEOTEXTILE WILL BE PLACED SHALL BE PREPARED TO A RELATIVELY SMOOTH SURFACE CONDITION. SURFACES SHALL BE FREE FROM OBSTRUCTION, DEBRIS, DEPRESSIONS, EROSION FEATURE, OR VEGETATION. ANY IRREGULARITIES SHALL BE REMOVED SO AS TO ENSURE CONTINUOUS, INTIMATE CONTACT OF THE GEOTEXTILE WITH THE SURFACE. ANY LOOSE MATERIAL, OR SOFT OR LOW DENSITY POCKETS OF MATERIAL, SHALL BE REMOVED, FILLED WITH SUITABLE SUBGRADE FILL, AND COMPACTED. EROSION FEATURES SUCH AS RILLS AND GULLIES MUST BE GRADED OUT OF THE SURFACE BEFORE GEOTEXTILE
- 3. AT THE TIME OF INSTALLATION, FABRIC SHALL BE REJECTED IF IT HAS DEFECTS, RIPS, HOLES, FLAWS, DETERIORATION OR DAMAGE INCURRED DURING MANUFACTURE,
- 4. FABRIC SHALL BE PLACED WITH THE LONG DIMENSION PARALLEL TO THE CENTERLINE OF THE BALLASTS AND LAY SMOOTH AND FREE OF TENSION, STRESS, FOLDS,
- 5. CRUSHED STONE FOR ACCESS ROADS SHALL BE PLACED IN MAXIMUM 6-INCH LOOSE LIFTS AND COMPACTED TO A MINIMUM OF 92% OF MAXIMUM DRY DENSITY (MODIFIED
- 6. LOAM BORROW FOR BASIN A BERM SHALL BE PLACED IN MAXIMUM 6-INCH LOOSE LIFTS AND COMPACTED TO A MINIMUM OF 92% OF MAXIMUM DRY DENSITY (MODIFIED

EROSION AND SEDIMENTATION CONTROL PLAN:

THIS PLAN HAS BEEN DEVELOPED TO PROVIDE A STRATEGY FOR CONTROLLING SOIL EROSION AND SEDIMENTATION DURING AND AFTER CONSTRUCTION OF THE PROPOSED PROJECT.

THIS PLAN IS BASED ON STANDARDS AND SPECIFICATIONS FOR EROSION PREVENTION IN DEVELOPING AREAS AS CONTAINED IN MASSACHUSETTS EROSION AND SEDIMENT CONTROL GUIDELINES FOR URBAN AND SUBURBAN AREAS, 2003.

GENERAL EROSION AND SEDIMENTATION CONSTRUCTION DETAIL NOTES:

SEE DRAWING C-101 FOR SEDIMENT AND EROSION CONTROL CONSTRUCTION SEQUENCING, DURING CONSTRUCTION, THE CONTRACTOR SHALL TAKE ALL REASONABLE MEASURES TO SCHEDULE EARTHWORK OPERATIONS SUCH THAT THE AREA OF EXPOSED AND DISTURBED SOIL IS MINIMIZED. CONSTRUCTION SHALL BE PHASED TO MINIMIZE THE AREA OF DISTURBED SOIL THAT IS EXPOSED AT ANY ONE TIME. UPGRADIENT STORM WATER DIVERSION AND DISPERSION MEASURES SHALL BE INSTALLED WHERE APPROPRIATE. ALL CUT AND FILL SLOPES SHALL BE STABILIZED UPON COMPLETION. THE FOLLOWING MEASURES WILL BE UNDERTAKEN TO PROVIDE MAXIMUM PROTECTION TO THE SOIL, WATER, AND ABUTTING LANDS:

PRIOR TO GRUBBING OR ANY EARTH MOVING OPERATION, SEDIMENT BARRIERS, OR OTHER APPROPRIATE PERIMETER CONTROL BEST MANAGEMENT PRACTICES (BMPS) SHALL BE INSTALLED ACROSS THE SLOPE ON THE CONTOUR AT THE DOWNHILL LIMIT OF THE WORK AS PROTECTION AGAINST CONSTRUCTION RELATED EROSION. INSTALL ALL NECESSARY STORMWATER DIVERSIONS AND DISPERSION

- PERMANENT SOIL STABILIZATION MEASURES FOR ALL SLOPES, OR ANY DISTURBED LAND AREA SHALL BE COMPLETED WITHIN FOURTEEN CALENDAR DAYS AFTER FINAL GRADING HAS BEEN COMPLETED. WHEN IT IS NOT POSSIBLE OR PRACTICAL TO PERMANENTLY STABILIZE DISTURBED LAND, TEMPORARY EROSION CONTROL MEASURES SHALL BE IMPLEMENTED ON DISTURBED AREAS (INCLUDING STOCKPILES) WITHIN FOURTEEN CALENDAR DAYS OF EXPOSURE OF SOIL OR FORMATION OF PILES, UNLESS THESE AREAS ARE TO BE SUBSEQUENTLY SURFACED WITH PERMANENT STRUCTURES. ALL DISTURBED AREAS SHALL BE MULCHED FOR EROSION CONTROL UPON COMPLETION OF ROUGH GRADING.
- ANY EXPOSED SLOPES 3:1 OR GREATER SHALL BE STABILIZED WITH EROSION CONTROL BLANKETS (ERONET C125 BY NORTH AMERICAN GREEN, OR APPROVED EQUAL) TO PREVENT EROSION DURING CONSTRUCTION AND TO FACILITATE REVEGETATION AFTER TOPSOILING AND SEEDING.
- 3. EXISTING TOPSOIL SHALL BE SAVED, STOCKPILED, AND REUSED AS MUCH AS POSSIBLE ON SITE. SEDIMENT BARRIER SHALL BE INSTALLED AT THE BASE OF STOCKPILES AT THE DOWNHILL LIMIT TO PROTECT AGAINST EROSION. STOCKPILES ANTICIPATED TO REMAIN FOR MORE THAN 14 CALENDAR DAYS SHALL BE STABILIZED BY SEEDING AND MULCHING UPON FORMATION OF THE PILES. UPGRADIENT OF THE STOCKPILES, STABILIZED DITCHES AND/OR BERMS SHALL BE CONSTRUCTED TO DIVERT STORMWATER RUNOFF AWAY FROM THE PILES.
- INTERCEPTED SEDIMENT SHALL BE REMOVED WHEN IT REACHES ONE-HALF THE HEIGHT OF THE SEDIMENT BARRIER, OR AS DIRECTED IN THE DRAWING DETAILS FOR OTHER BMPS, AND SHALL BE DEPOSITED IN AN AREA THAT SHALL NOT CONTRIBUTE TO SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED. ALL DAMAGED EROSION CONTROL DEVICES SHALL BE REPAIRED AND/OR REPLACED IMMEDIATELY. DEVICES NO LONGER SERVICEABLE DUE TO SEDIMENT ACCUMULATION SHALL ALSO BE
- 5. SOIL CUTTINGS GENERATED DURING THE DRILLING OF PILOT HOLES FOR GROUND SCREWS SHALL BE REMOVED AND COLLECTED. SOIL CUTTINGS MAY BE STOCKED PILED TEMPORARILY, BUT ULTIMATELY SHALL BE DISPOSED AND SPREAD IN AN AREA THAT SHALL NOT CONTRIBUTE TO OFF-SITE SEDIMENTATION, AND PERMANENTLY STABILIZED.
- ADDITIONAL EROSION CONTROL METHODS SHALL BE IMPLEMENTED IF CONSTRUCTION OCCURS AFTER DECEMBER 15TH. ALL DISTURBED AREAS SHALL BE MINIMIZED TO THE EXTENT POSSIBLE. PRIOR TO FREEZING. ADDITIONAL EROSION CONTROL DEVICES SHALL BE INSTALLED AS APPROPRIATE. INSPECTION OF THESE EROSION CONTROL ITEMS SHALL BE FREQUENT, WITH PARTICULAR ATTENTION PAID TO WEATHER PREDICTIONS TO ENSURE THAT THESE MEASURES ARE PROPERLY IN PLACE TO HANDLE LARGE QUANTITIES OF RUNOFF RESULTING FROM HEAVY RAINS OR EXCESSIVE THAWS.
- 7. GENERAL EROSION AND SEDIMENTATION CONTROL ACTIONS SHALL INCLUDE THE FOLLOWING:
- MARK SOIL DISTURBANCE LIMITS
- INSTALL SEDIMENT BARRIERS BEFORE DISTURBING ANY SOILS DIVERT AND DISPERSE STORM WATER RUNOFF TO UNDISTURBED AREAS WHEREVER POSSIBLE
- MULCH DISTURBED AREAS
- INSPECT AND REPAIR EROSION CONTROLS AND SEDIMENT BARRIERS

- 1. CONSTRUCTION ACTIVITIES SHALL BE SCHEDULED TO MINIMIZE THE AREA OF DISTURBED SOIL THAT IS EXPOSED AT ONE TIME.
- 2. DUST CONTROL SHALL BE USED ON CONSTRUCTION ROUTES AND OTHER DISTURBED AREAS SUBJECT TO SURFACE DUST
- 3. MAINTAIN DUST CONTROL MEASURES PROPERLY THROUGH DRY WEATHER PERIODS UNTIL ALL DISTURBED AREAS HAVE BEEN
- 4. DUST CONTROL METHODS SHALL BE APPROVED BY THE ENGINEER AND MAY INCLUDE VEGETATIVE COVER, MULCH (INCLUDING GRAVEL MULCH), SPRINKLING, STONE, AND BARRIERS.
- 5. VEGETATIVE COVER FOR DISTURBED AREAS NOT SUBJECT TO TRAFFIC, VEGETATION PROVIDES THE MOST PRACTICAL METHOD
- 6. MULCH (INCLUDING GRAVEL MULCH) WHEN PROPERLY APPLIED, MULCH OFFERS A FAST, EFFECTIVE MEANS OF CONTROLLING DUST. SEE MANUFACTURER'S RECOMMENDATIONS OR THE MASSACHUSETTS EROSION AND SEDIMENT CONTROL GUIDELINES FOR URBAN AND SUBURBAN AREAS, 2003 FOR APPLICATION RATES
- 7. SPRINKLING EXPOSED SOILS MAY BE SPRINKLED UNTIL THE SURFACE IS WET. SPRINKLING IS ESPECIALLY EFFECTIVE FOR DUST CONTROL ON HAUL ROADS AND OTHER TRAFFIC ROUTES.
- 8. STONE USED TO STABILIZE CONSTRUCTION ROADS; CAN ALSO BE EFFECTIVE FOR DUST CONTROL.
- 9. BARRIERS A BOARD FENCE, WIND FENCE, SEDIMENT FENCE, OR SIMILAR BARRIER CAN CONTROL AIR CURRENTS AND BLOWING SOIL. ALL OF THESE FENCES ARE NORMALLY CONSTRUCTED OF WOOD AND THEY PREVENT EROSION BY OBSTRUCTING THE WIND NEAR THE GROUND AND PREVENTING THE SOIL FROM BLOWING OFFSITE.

UNLESS OTHERWISE AGREED IN A WRITTEN CONTRACT BETWEEN WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, INC. AND ITS CLIENT: (I) THIS DOCUMENT BY ANY OTHER USE OR RELIANCE ON THIS DOCUMENT BY ANY THIRD PARTY IS AT THAT PARTY'S SOLE RISK AND RESPONSIBILITY

MONITORING PROGRAM:

- 1. EROSION AND SEDIMENTATION CONTROLS SHALL BE INSPECTED AT LEAST ONCE EVERY 7 CALENDAR DAYS AND WITHIN 24 HOURS OF THE END OF A STORM EVENT OF 0.25 INCHES OR GREATER. DAILY RAINFALL SHALL BE MONITORED AND RECORDED BY THE CONTRACTOR. ALL STRUCTURES DAMAGED BY CONSTRUCTION EQUIPMENT, VANDALS, OR THE ELEMENTS SHALL BE REPAIRED OR REPLACED IMMEDIATELY, PRIOR TO CONTINUING THE CONSTRUCTION.
- 2. FOLLOWING THE FINAL SEEDING, THE SITE SHALL BE INSPECTED IN ACCORDANCE WITH THE SCHEDULE OUTLINED IN #1 ABOVE, TO ENSURE THAT THE VEGETATION HAS BEEN ESTABLISHED (70% COVER ACHIEVED). IN THE EVENT OF ANY UNSATISFACTORY GROWTH, RESEEDING WILL BE CARRIED OUT, WITH FOLLOW-UP INSPECTION.
- 3. AFTER THE CONSTRUCTION INSPECTOR HAS DETERMINED THAT THE PROJECT AREA HAS BEEN PERMANENTLY STABILIZED (70% COVER HAS BEEN ACHIVED OR NON-VEGETATED MEASURES HAVE BEEN IMPLEMENTED). THE CONTRACTOR SHALL REMOVE ALL SEDIMENT BARRIERS, TEMPORARY SEDIMENTATION CONTROL RISERS AND ANY OTHER TEMPORARY EROSION CONTROL

SEEDING AND REVEGETATION PLAN:

IMMEDIATELY FOLLOWING THE COMPLETION OF TREE CLEARING, ALL DISTURBED AREAS SHALL BE TREATED AS STATED BELOW IN ORDER TO MINIMIZE CONSTRUCTION-PERIOD EROSION.

APPLY SEED/TACKIFIER MIX ACCORDING TO THE FOLLOWING SPECIFICATIONS:

1. SEED: ERNST SEEDS QUICK EROSION CONTROL COVER MIX CONSISTING OF (% BY WEIGHT):

• 50% LOLIUM MULTIFLORUM (ANNUAL RYEGRASS) • 50% LOLIUM PERENNE, 'BIGLEAGUE' (PERENNIAL RYEGRASS, 'BIGLEAGUE')

SEEDING RATE: 50 LBS PER ACRE

2. TACKIFIER: GEOPERM BONDED FIBER MATRIX (OR APPROVED EQUAL) APPLIED PER MANUFACTURER SPECIFICATIONS.

UPON COMPLETION OF SITE CONSTRUCTION, ALL AREAS PREVIOUSLY DISTURBED SHALL BE TREATED AS STATED BELOW. THESE AREAS WILL BE CLOSELY MONITORED BY THE CONTRACTOR UNTIL SUCH TIME AS A SATISFACTORY GROWTH OF VEGETATION IS ESTABLISHED. SATISFACTORY GROWTH SHALL MEAN A MINIMUM OF 70% OF THE AREA IS VEGETATED WITH VIGOROUS GROWTH.

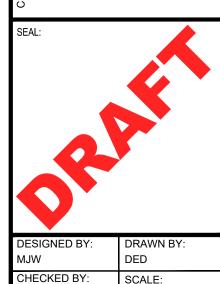
- APPLY SEED AS DIRECTED BELOW:

 - SEED DISTURBED AREAS AT THE RATE OF 30 LBS PER ACRE OF ERNST SEEDS NORTHEAST SOLAR POLLINATOR 4' MIX CONSISTING OF (% BY WEIGHT):
 - ••• 35% BOUTELOUA CURTIPENDULA, BUTTE (SIDEOATS GRAMA, BUTTE) ••• 35% SCHIZACHYRIUM SCOPARIUM, 'CAMPER' (LITTLE BLUESTEM, 'CAMPER')
 - ••• 10% PANICUM SPHAERONCARPON (ROUNDSEED PANICGRASS)
 - ••• 4% ASCLEPIAS TUBEROSA (BUTTERFLY MILKWEED)
 - ••• 4% CHAMAECRISTA FASCICULATA, PA ECOTYPE (PARTRIDGE PEA, PA ECOTYPE) ••• 4% COREOPSIS LANCEOLATA (LANCELEAF COREOPSIS)
 - ••• 4% RUDBECKIA HIRTA (BLACKEYED SUSAN)
 - ••• 0.9% PYCNANTHEMUM TENUIFOLIUM (NARROWLEAF MOUNTAINMINT)
 - ••• 0.7% ASTER OBLONGIFOLIUS, (AROMATIC ASTER, PA ECOTYPE)

 - ••• 0.5% ASTER PRENANTHOIDES, PA ECOTYPE (ZIGZAG ASTER, PA ECOTYPE)
 - ••• 0.5% PENSTEMON DIGITALIS (TALL WHITE BEARDTONGUE)
 - ••• 0.5% TRADESCANTIA OHIENSIS (OHIO SPIDERWORT, PA ECOTYPE) ••• 0.5% ZIZIA AUREA (GOLDEN ALEXANDERS)
 - ••• 0.3% OENOTHERA FRUTICOSA VAR. FRUTICOSA (SUNDROPS)
 - ••• 0.1% SOLIDAGO NEMORALIS, PA ECOTYPE (GRAY GOLDENROD, PA ECOTYPE)
 - APPLY WOOD FIBER MULCH AT A RATE OF 2,000 LBS PER ACRE FOR MAXIMUM MOISTURE RETENTION.
- SEEDING SHALL HAVE A MINIMUM GERMINATION PERCENTAGE OF 85%. (NOVEMBER 1ST THROUGH DECEMBER 15TH)
- SEED DISTURBED AREAS AT THE RATE OF 3 LBS PER 1,000 SQ. FT. OF WINTER RYE
- APPLY HAY MULCH AT THE RATE OF 100 LBS PER 1,000 SQ. FT. (AFTER DECEMBER 15TH)
- DO NOT SEED. APPLY HAY MULCH AT THE RATE OF 100 LBS PER 1,000 SQ. FT.
- 3. SEEDING METHODS MAY BE DRILL SEEDINGS, BROADCASTS AND ROLLED, CULTIPACKED, OR TRACKED WITH A SMALL TRACK PIECE OF CONSTRUCTION EQUIPMENT, OR HYDRO-SEEDING, WITH SUBSEQUENT TRACKING.
- 4. WATERING MAY BE REQUIRED DURING DRY PERIODS CONSULT SEED MANUFACTURER'S INSTRUCTIONS.
- INSPECT SEEDED AREAS FOR FAILURE AND MAKE NECESSARY REPAIRS AND RESEED IMMEDIATELY. CONDUCT A FOLLOW-UP SURVEY AFTER ONE YEAR AND RESEED WHERE NECESSARY.
- 6. ALL SEDIMENT CONTROL STRUCTURES LOCATED DOWN GRADIENT OF SOILS STABILIZED BY VEGETATIVE MEASURES SHALL REMAIN IN PLACE UNTIL VEGETATION IS ESTABLISHED. ESTABLISHED MEANS A MINIMUM OF 70% OF THE AREA IS VEGETATED WITH VIGOROUS GROWTH.

WOOD MASSACHUSETTS, INC. 271 MILL ROAD CHELMSFORD MASSACHUSETTS 01824 TELEPHONE: (978) 692-9090 FAX: (978) 692-6633 WEB: WWW.WOODPLC.COM

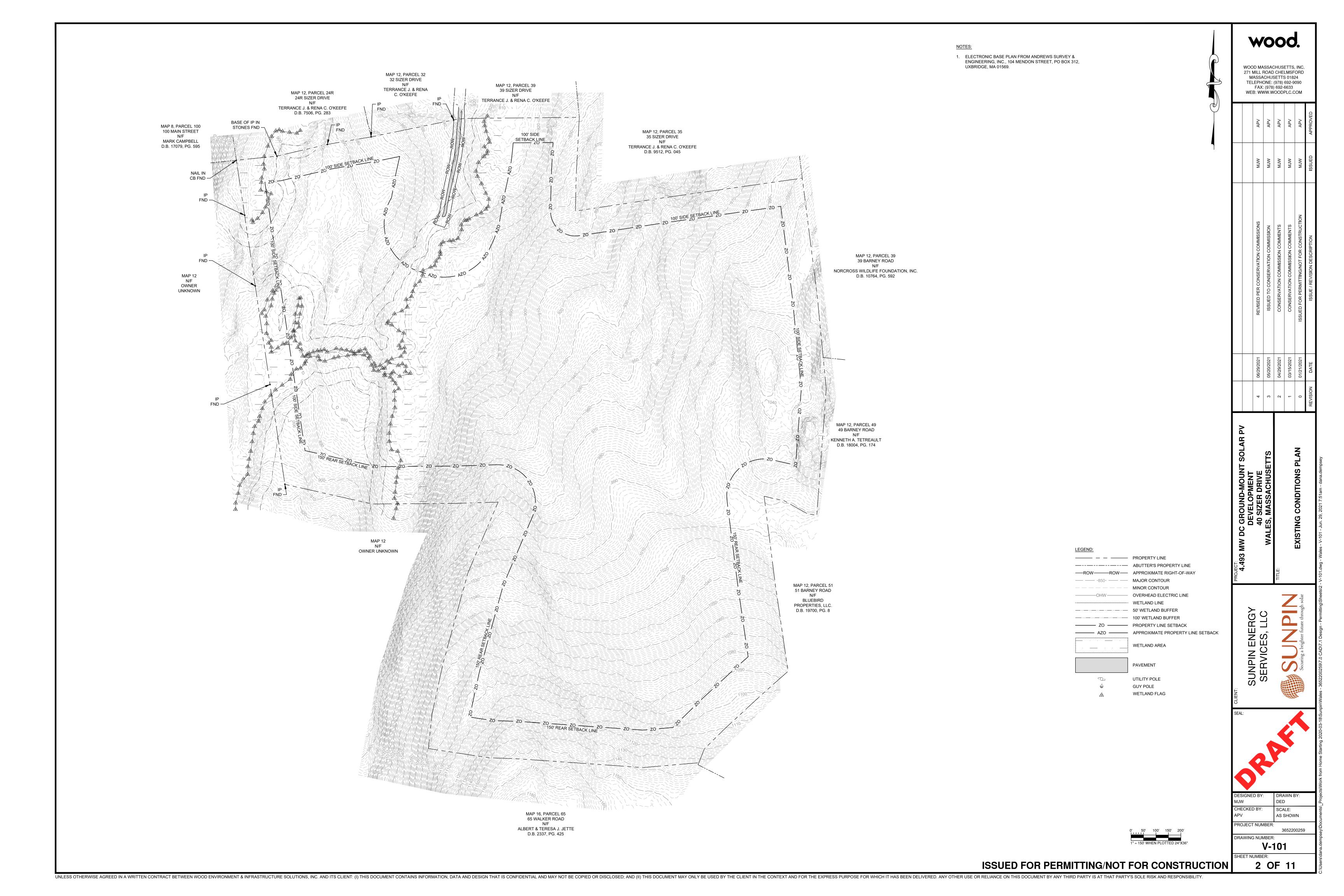
PV BV					
- 					
	4	06/29/2021	REVISED PER CONSERVATION COMMISSIONS	MJW	APV
	3	05/20/2021	ISSUED TO CONSERVATION COMMISSION	MCM	APV
	2	04/29/2021	CONSERVATION COMMISSION COMMENTS	MCM	APV
_	1	03/15/2021	CONSERVATION COMMISSION COMMENTS	MCM	APV
S	0	01/21/2021	ISSUED FOR PERMITTING/NOT FOR CONSTRUCTION	MJW	APV
	REVISION	DATE	ISSUE / REVISION DESCRIPTION	ISSUED	APPROVED

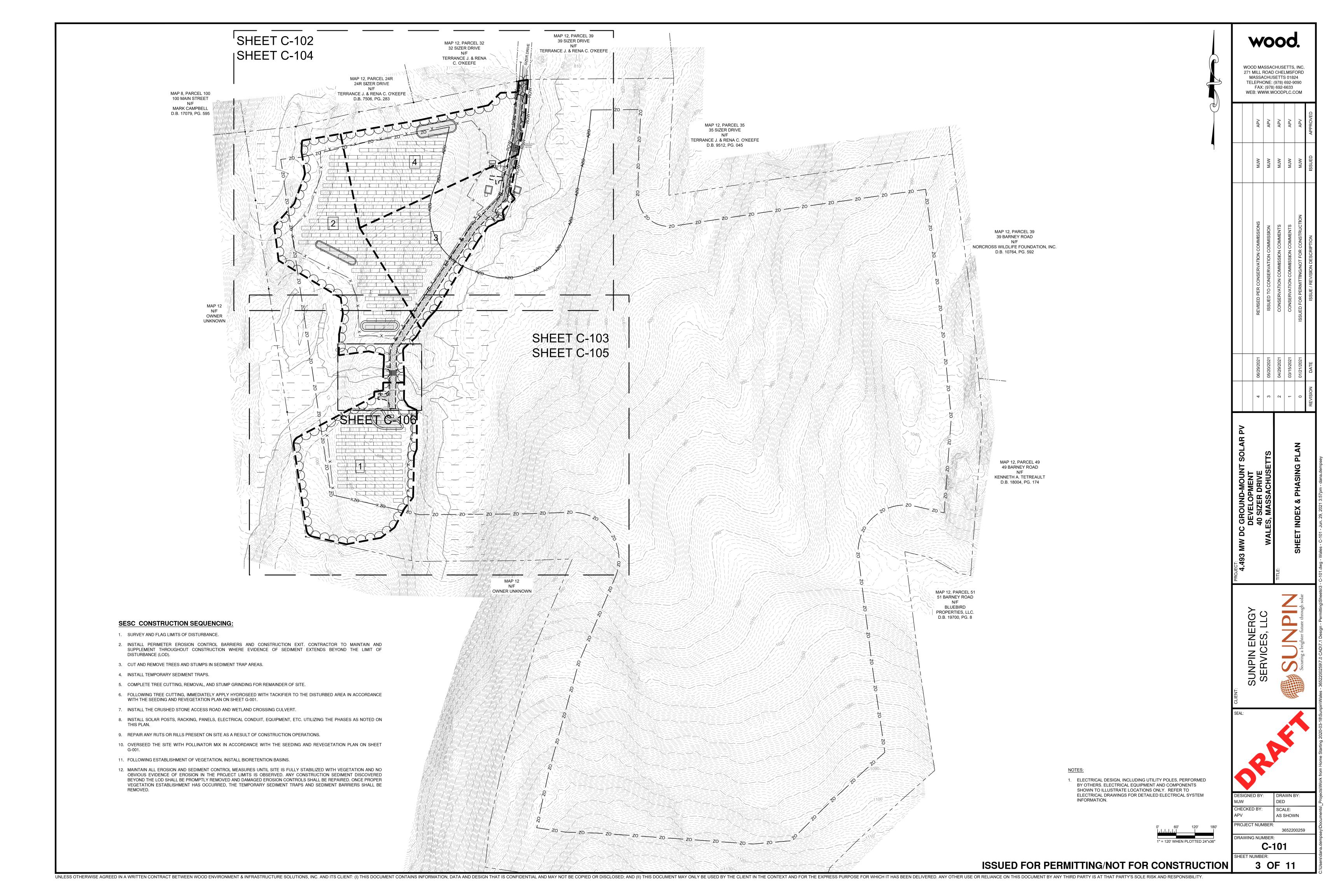


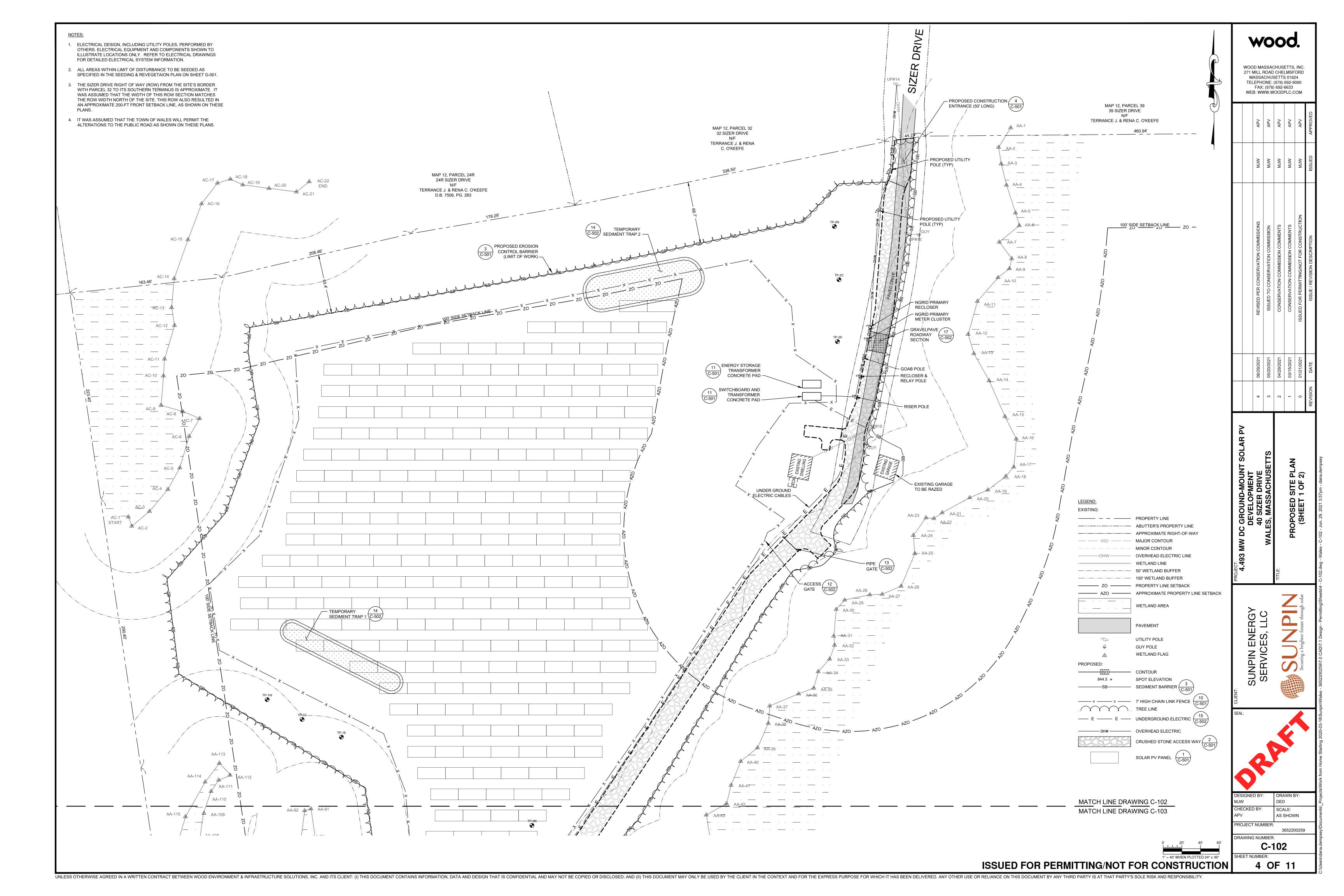
AS SHOWN ROJECT NUMBER 3652200259 DRAWING NUMBER G-001

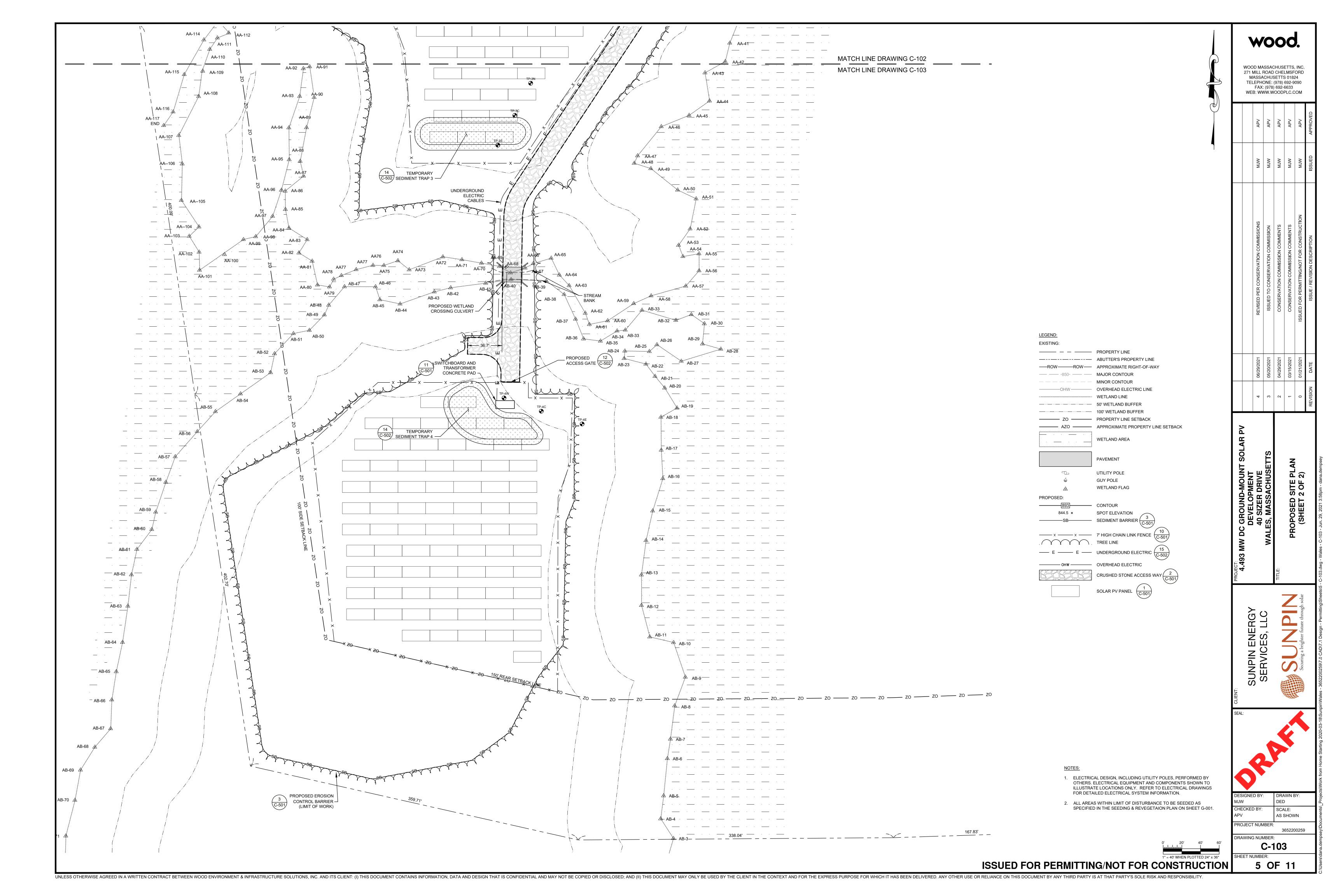
OF 1⁻

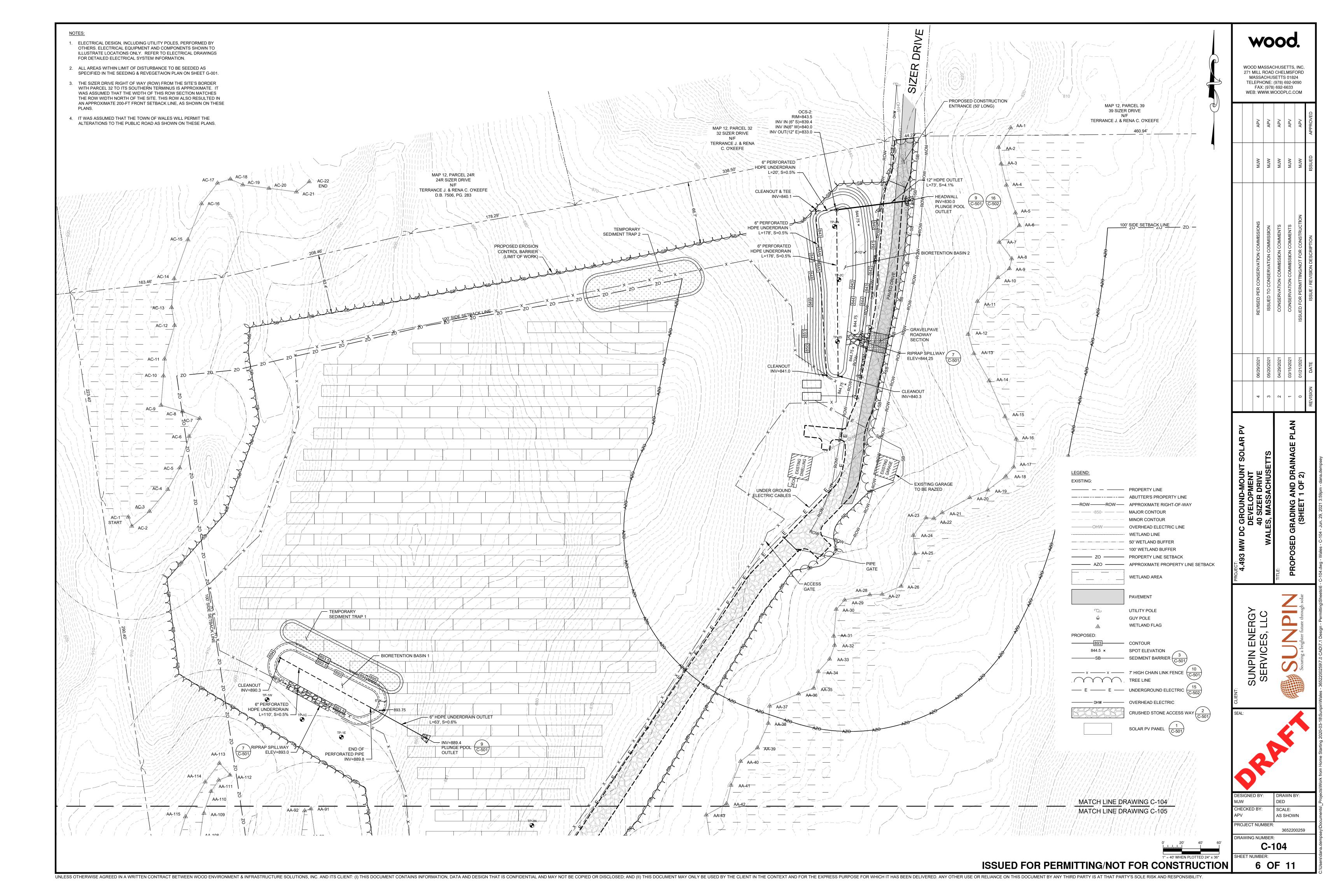
ISSUED FOR PERMITTING/NOT FOR CONSTRUCTION

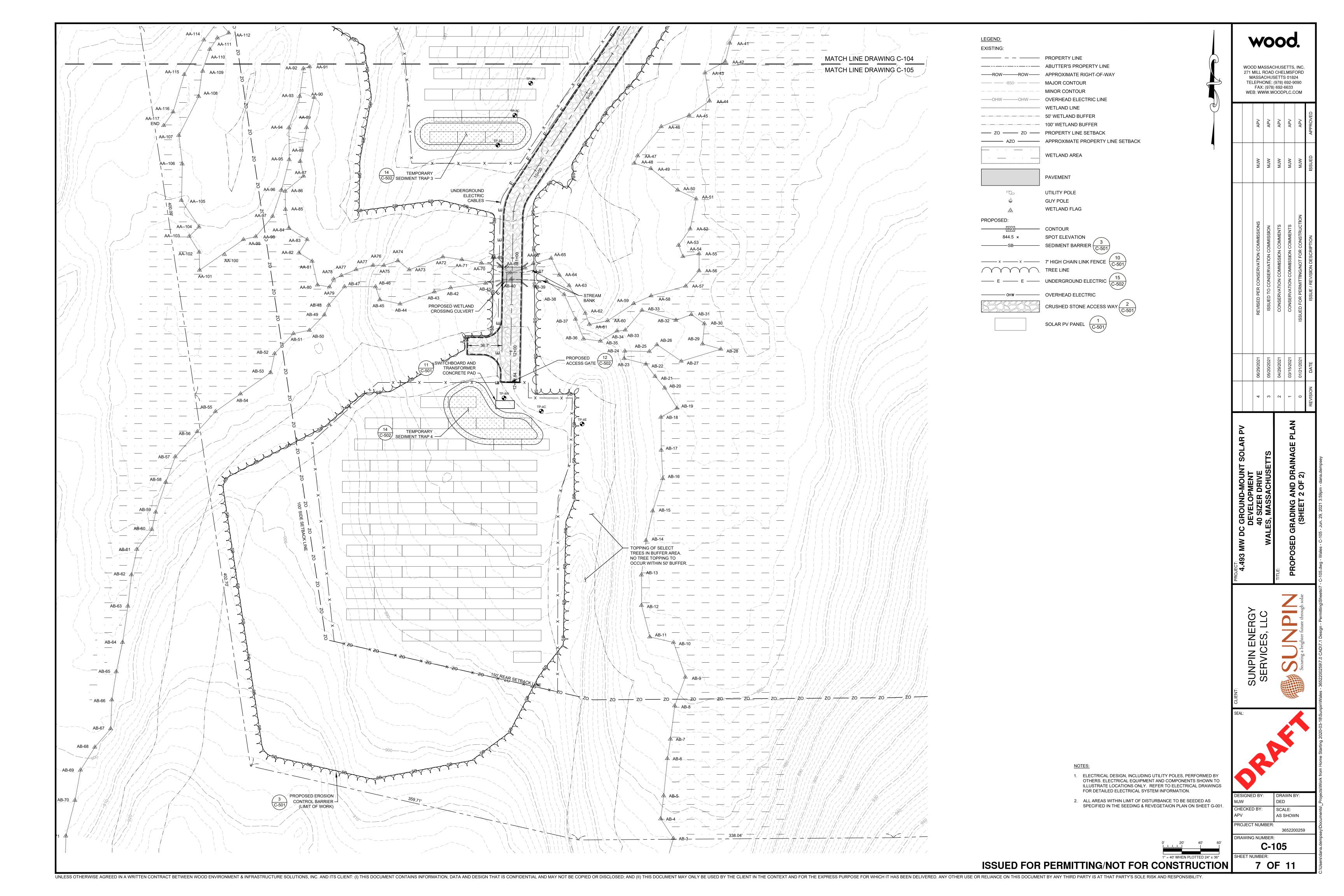












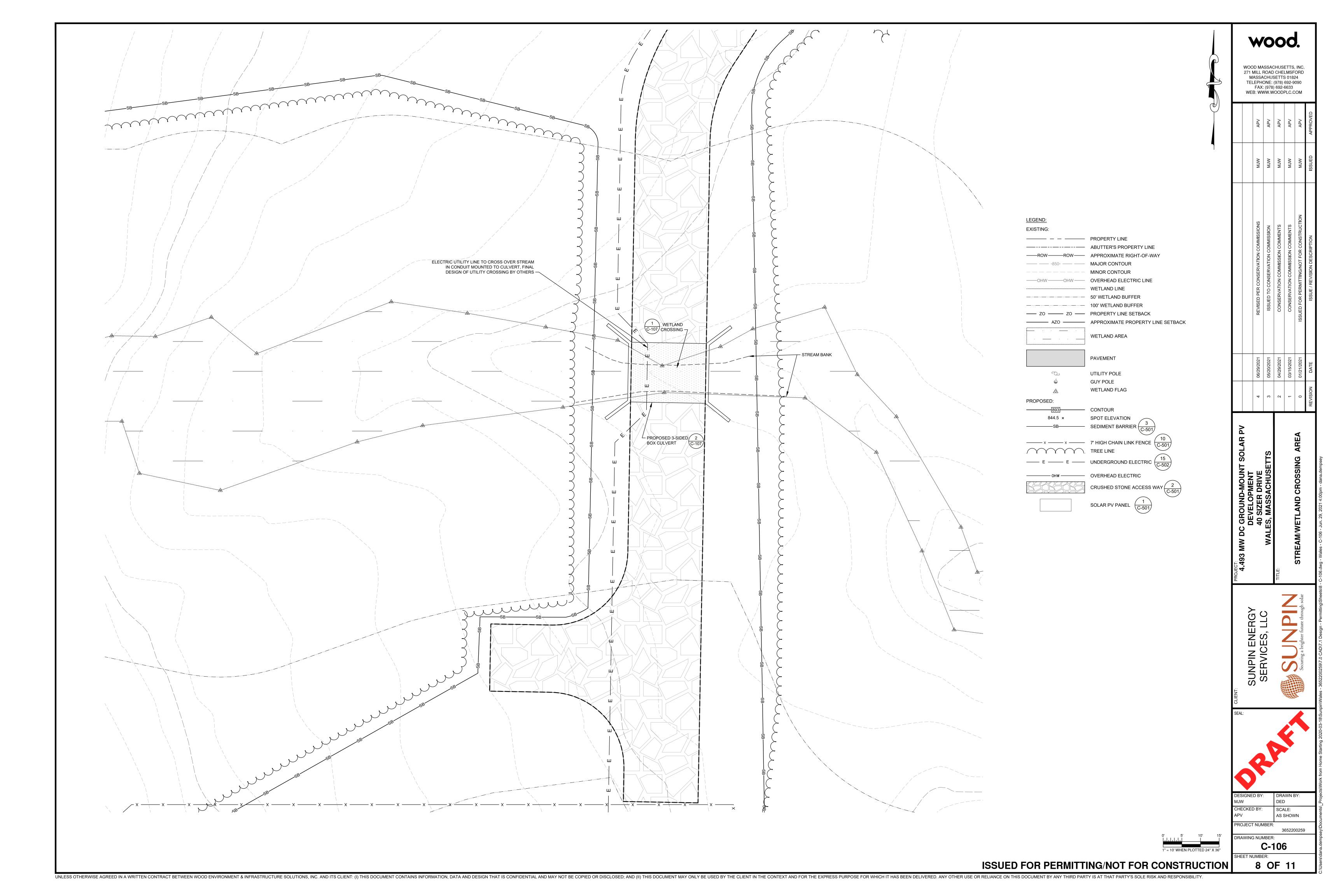


TABLE 1. STREAM CROSSING STANDARDS

PERFORMANCE STANDARD:	STANDARDS MET AT STREAM CROSSING:
. TYPE OF CROSSING GENERAL: SPANS (BRIDGES, 3-SIDED BOX CULVERTS, OPEN BOTTOM CULVERTS OR ARCHES) ARE STRONGLY PREFERRED. OPTIMUM: USE A BRIDGE.	A 3-SIDED BOX CULVERT THAT SPANS THE EXISTING STREAM HAS BEEN PROPOSED.
EMBEDMENT ALL CULVERTS SHOULD BE EMBEDDED (SUNK INTO STREAM) A MINIMUM OF 2 FEET, AND ROUND PIPE CULVERTS AT LEAST 25%. IF PIPE CULVERT CANNOT BE EMBEDDED THIS DEEP, THEN THEY SHOULD NOT BE USED WHEN EMBEDMENT MATERIAL INCLUDED ELEMENTS > 15 INCHES IN DIAMETER, EMBEDMENT DEPTHS SHOULD BE AT LEAST TWICE THE D84 (PARTICLE WIDTH LARGER THAN 84% OF PARTICLES) OF THE EMBEDMENT MATERIAL.	A 3-SIDED BOX CULVERT THAT SPANS THE EXISTING STREAM HAS BEEN PROPOSED. THERE IS NO EMBEDDING THAT WILL BE INCORPORATED INTO THIS STREAM CROSSING.
3. CROSSING SPAN GENERAL: SPANS CHANNEL WIDTH (A MINIMUM OF 1.2 TIMES THE BANKFULL WIDTH OF THE STREAM. OPTIMUM: SPANS THE STREAMBED AND BANKS (AT LEAST 1.2 TIMES BANKFULL WIDTH) WITH SUFFICIENT HEADROOM TO PROVIDE DRY PASSAGE FOR WILDLIFE.	THE EXISTING BANKFULL WIDTH OF THE STREAM IS APPROXIMATELY 6 FEET. THE PROPOSED SPAN OF THE 3-SIDED BOX CULVERT IS 16 FEET WHICH IS 2.17 TIMES THE WIDTH OF THE EXISTING BANKFULL STREAM.
I. OPENNESS GENERAL: OPENNESS RATIO (CROSS SECTIONAL AREA/CROSSING LENGTH) OF AT LEAST 0.82 FEET (0.25 METERS). THE CROSSING SHOULD BE WIDE AND HIGH RELATIVE TO ITS LENGTH. OPTIMUM: OPENNESS RATIO OF AT LEAST 1.64 FEET (0.5 METERS) AND MINIMUM HEIGHT OF 6 FEET. IF CONDITION SIGNIFICANTLY REDUCE WILDLIFE PASSAGE NEAR A CROSSING (E.G. STEEP EMBANKMENTS, HIGH TRAFFIC VOLUMES, AND PHYSICAL BARRIERS), MAINTAIN A MINIMUM HEIGHT OF 8 FEET (2.4 METERS) AND OPENNESS RATIO OF 2.46 FEET (0.75 METERS).	X-SEC CULVERT AREA PRE-EMBED - EMBEDDED AREA CULVERT LENGTH 64 S.F 16 S.F. 22 FEET = 2.18 (UPSTREAM END) 64 S.F 16 S.F. 22 FEET = 2.18 FEET (DOWNSTREAM END) THE PROPOSED 3-SIDED BOX CULVERT MEETS STREAM CROSSING STANDARDS. THE OPENNESS RATIO FOR THE CULVERT IS 2.18 FEET.
5. CROSSING SPAN NATURAL BOTTOM SUBSTRATE SHOULD BE USED WITHIN THE CROSSING AND IT SHOULD MATCH THE UPSTREAM AND DOWNSTREAM SUBSTRATES. THE SUBSTRATE AND DESIGN SHOULD RESIST DISPLACEMENT DURING FLOWS AND MAINTAIN APPROPRIATE BOTTOM DURING NORMAL FLOWS.	A 3-SIDED BOX CULVERT THAT SPANS THE EXISTING STREAM HAS BEEN PROPOSED. THERE IS NO EMBEDDING THAT WILL BE INCORPORATED INTO THIS STREAM CROSSING AND THE NATURAL STREAM BED WILL BE UTILIZED. EROSION CONTROL WILL BE PLACED ON BOTH SIDES OF THE NATURAL CHANNEL.
6. WATER DEPTH AND VELOCITY WATER DEPTHS AND VELOCITIES ARE COMPARABLE TO THOSE FOUND IN THE NATURAL CHANNEL AT A VARIETY OF FLOWS.	A 3-SIDED BOX CULVERT THAT SPANS THE EXISTING INTERMITTENT STREAM HAS BEEN PROPOSED AND THE NATURAL GRADES WILL BE UTILIZED. HOLDING CURRENT ELEVATIONS, DEPTHS AND VELOCITIES WHEN WATER IS PRESENT IS COMPARABLE.

