PPA# 25-1374

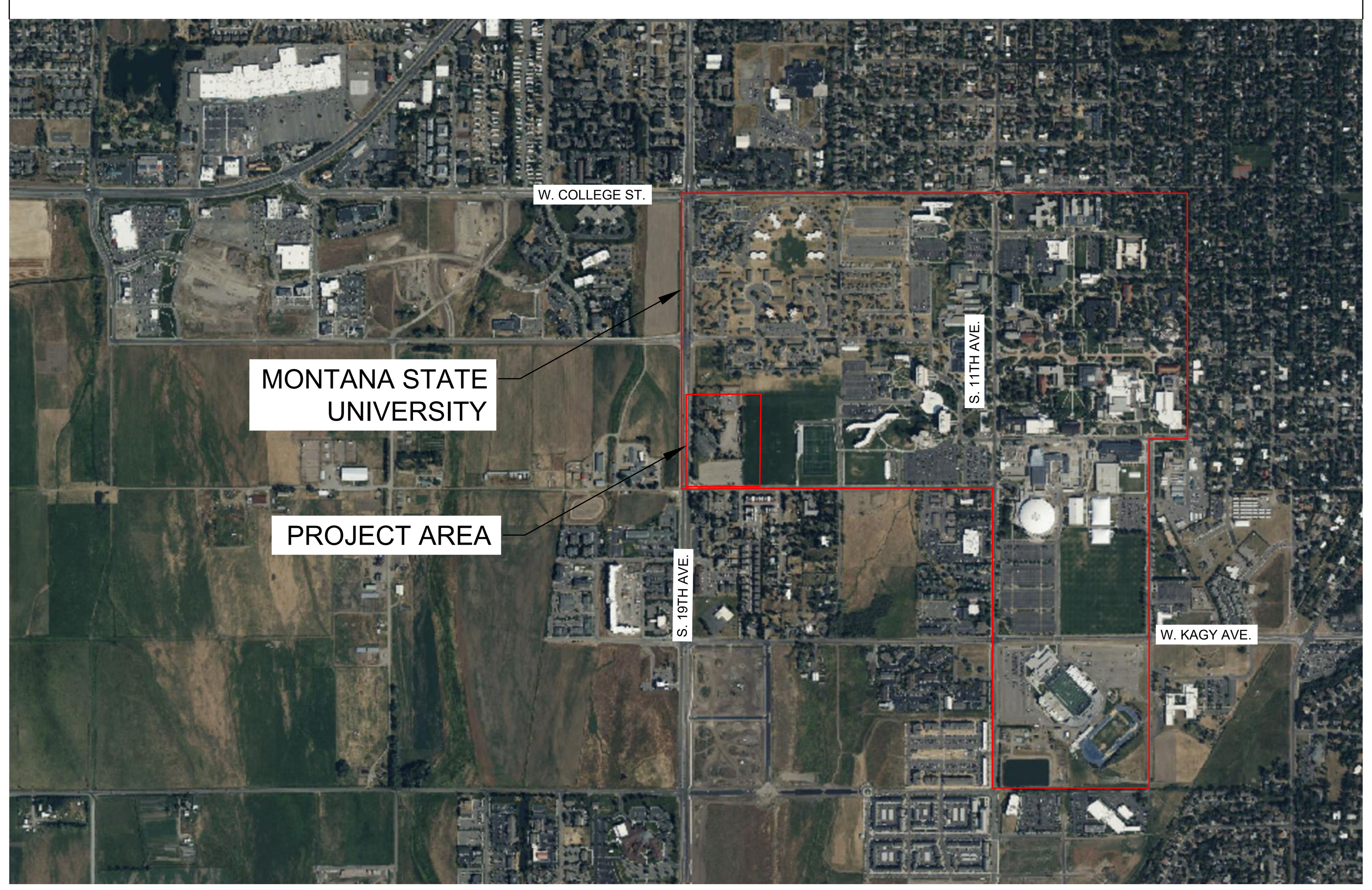
RECONSTRUCTION OF PARKING LOT 21

MONTANA STATE UNIVERSITY

BOZEMAN, MT

LOCATION MAP
NTS

BOZEMAN, MT



VICINITY MAP
NTS

PREPARED FOR:

STATE OF MONTANA - MONTANA STATE UNIVERSITY
UNIVERSITY FACILITIES MANAGEMENT, PLANNING, DESIGN & CONSTRUCTION
PLEW BUILDING 6TH & GRANT
PO BOX 172760
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MONTANA STATE UNIVERSITY

PREPARED BY:

DJ&A
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BOZEMAN, MT 59715
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SHEET INDEX:

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RECONSTRUCTION OF PARKING LOT 21
CONSTRUCTION DOCUMENTS

DRAWN BY: V. NEARY
REVIEWED BY: S. ESLINGER

REV.	DESCRIPTION	DATE

MONTANA SHARI ESLINGER No. 45472 LICENSED PROFESSIONAL ENGINEER

PPA#25-1374

COVER

SHEET
GI0.1

DATE
04-30-2026

GENERAL NOTES

1. WHERE CONDITIONS ARE ENCOUNTERED WHICH APPEAR DIFFERENT FROM THOSE INDICATED ON THE PLANS OR IN THE SPECIFICATIONS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO THE PERFORMANCE OF WORK

2. UTILITIES: UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND BASED ON AVAILABLE RECORDS AND SURFACE OBSERVATIONS. THE ENGINEER DOES NOT GUARANTEE THE ACCURACY OR COMPLETENESS OF THIS INFORMATION, AND ADDITIONAL UTILITIES MAY EXIST.

   THE CONTRACTOR SHALL LOCATE ALL EXISTING UTILITIES, COORDINATE WITH UTILITY OWNERS, AND FIELD VERIFY THE LOCATION, SIZE, AND ELEVATION OF ALL UTILITIES WITHIN THE PROJECT LIMITS PRIOR TO CONSTRUCTION, INCLUDING POTHOLING AT CROSSINGS AND POTENTIAL CONFLICT AREAS.

   THE CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES DURING CONSTRUCTION. ANY DAMAGE RESULTING FROM CONSTRUCTION OPERATIONS SHALL BE REPAIRED OR REPLACED AT NO COST TO THE OWNER IN ACCORDANCE WITH UTILITY OWNER REQUIREMENTS.

   IF DISCREPANCIES OR CONFLICTS ARE ENCOUNTERED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH WORK IN THE AFFECTED AREA UNTIL DIRECTION IS PROVIDED.

3. SPECIFICATIONS & GOVERNING DOCUMENT HIERARCHY: ALL WORK SHALL CONFORM TO THE CONTRACT DOCUMENTS, INCLUDING THE DRAWINGS AND PROJECT MANUAL. IN THE EVENT OF DISCREPANCIES BETWEEN DOCUMENTS, THE FOLLOWING ORDER OF PRECEDENCE SHALL GOVERN:
   - 3.1. CONSTRUCTION DOCUMENTS (INCLUDING NOTES AND DETAILS)
   - 3.2. PROJECT MANUAL (INCLUDING TECHNICAL SPECIFICATIONS AND SPECIAL PROVISIONS)
   - 3.3. MONTANA STATE UNIVERSITY (MSU STANDARDS)
   - 3.4. MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS (MPWSS), LATEST EDITION
   - 3.5. CITY OF BOZEMAN STANDARD SPECIFICATIONS

   WHERE CONFLICT EXISTS, THE ENGINEER WILL DETERMINE WHICH REQUIREMENT GOVERNS. THE CONTRACTOR SHALL NOT PROCEED WITH AFFECTED WORK UNTIL DIRECTION IS PROVIDED. THE MORE STRINGENT SHALL APPLY UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

4. PERMITS & FEES: THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, LICENSES, AND FEES REQUIRED FOR THE COMPLETION OF THE WORK, INCLUDING BUT NOT LIMITED TO MONTANA DEQ SWPPP/NOI. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS. THE CONTRACTOR SHALL COORDINATE ALL PERMITTING REQUIREMENTS WITH THE ENGINEER PRIOR TO CONSTRUCTION. ADDITIONAL PERMITS MAY BE REQUIRED BASED ON THE CONTRACTOR'S MEANS AND METHODS.

5. EROSION CONTROL & SWPPP: THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREPARING, SUBMITTING, AND OBTAINING APPROVAL OF THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) AND NOTICE OF INTENT (NOI) IN ACCORDANCE WITH MONTANA DEQ REQUIREMENTS PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL IMPLEMENT, MAINTAIN, AND UPDATE ALL EROSION AND SEDIMENT CONTROL MEASURES AS REQUIRED BY THE APPROVED SWPPP AND AS NECESSARY TO PREVENT SEDIMENT FROM LEAVING THE SITE.

   ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF CONSTRUCTION AND MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT UNTIL FINAL STABILIZATION IS ACHIEVED.

   THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSPECTION, MAINTENANCE, AND REPAIR OF ALL EROSION CONTROL MEASURES, INCLUDING AFTER STORMS.

6. DISPOSAL: ALL MATERIALS DESIGNATED FOR REMOVAL BECOME THE PROPERTY OF THE CONTRACTOR UPON REMOVAL AND ARE TO BE DISPOSED OF IN AN ENVIRONMENTALLY SAFE MANNER IN ACCORDANCE WITH ALL LOCAL, STATE & FEDERAL REQUIREMENTS.

7. EXISTING CONDITIONS AT THE SITE ARE THE RESPONSIBILITY OF THE CONTRACTOR & MUST BE FIELD VERIFIED BY THE CONTRACTOR.

8. CONSTRUCTION STAGING & STORAGE: NO SPECIFIC STAGING OR MATERIAL STORAGE AREAS HAVE BEEN DESIGNATED FOR THIS PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL STAGING, ACCESS, AND MATERIAL STORAGE AREAS WITH MSU PRIOR TO CONSTRUCTION. ALL STAGING AND STORAGE AREAS SHALL BE APPROVED BY MSU AND SHALL BE CONFINED TO APPROVED LOCATIONS. THE CONTRACTOR SHALL NOT USE ADJACENT PROPERTIES, ROADWAYS, OR CAMPUS FACILITIES FOR STAGING OR STORAGE WITHOUT PRIOR APPROVAL. THE CONTRACTOR SHALL MAINTAIN ALL STAGING AND STORAGE AREAS IN A CLEAN AND ORDERLY CONDITION AND SHALL RESTORE ALL AREAS TO THEIR ORIGINAL CONDITION OR BETTER UPON COMPLETION OF THE WORK.

9. THE CONTRACTOR SHALL PROTECT ADJACENT SITES FROM DAMAGE DURING CONSTRUCTION.

10. LOTS & STREET CLOSURES SHALL BE COORDINATED WITH & APPROVED BY MSU PARKING, MSU PLANNING, DESIGN, & CONSTRUCTION (PDC), & MSU FAMILY GRADUATE HOUSING STAFF 72 HOURS PRIOR TO CLOSURE.

11. ALL AREAS DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO EXISTING CONDITION OR BETTER AT THE CONTRACTOR'S EXPENSE.

12. RECORD DRAWINGS: THE CONTRACTOR SHALL MAINTAIN A COMPLETE AND ACCURATE SET OF REDLINED RECORD DRAWINGS THROUGHOUT CONSTRUCTION, DOCUMENTING ALL CHANGES FROM THE CONSTRUCTION DOCUMENTS, INCLUDING BUT NOT LIMITED TO UTILITY LOCATIONS, ELEVATIONS, AND FIELD ADJUSTMENTS. RECORD DRAWINGS SHALL BE KEPT CURRENT AND AVAILABLE FOR REVIEW BY THE ENGINEER UPON REQUEST. PRIOR TO FINAL ACCEPTANCE, THE CONTRACTOR SHALL SUBMIT A CLEAN, COMPLETE, AND LEGIBLE SET OF RECORD DRAWINGS TO THE ENGINEER.

13. CONTRACTOR SHALL REMOVE & DISPOSE OF ALL ABANDONED FACILITIES THAT ARE A RESULT OF THESE IMPROVEMENTS AS DESCRIBED IN THE PLANS AND SPECIFICATIONS.

14. REFER TO THE FOLLOWING DEFINITIONS FOR THE PLANS & SPECIFICATIONS:
    - 14.1. REMOVE: DETACH ITEMS FROM EXISTING CONSTRUCTION & LEGALLY DISPOSE OF THEM OFF-SITE UNLESS INDICATED TO BE REMOVED & SALVAGED OR REMOVED & REINSTALLED.
    - 14.2. REMOVE & SALVAGE: CAREFULLY DETACH FROM EXISTING CONSTRUCTION, IN A MANNER TO PREVENT DAMAGE, & DELIVER TO MSU.
    - 14.3. REMOVE & REINSTALL: DETACH ITEMS FROM EXISTING CONSTRUCTION, PREPARE FOR REUSE, & REINSTALL WHERE INDICATED.

LEGEND

EXISTING - LINE TYPES

- EXISTING - EDGE OF ASPHALT
- EXISTING - EDGE OF GRAVEL/ DIRT ROAD
- EXISTING - CURB FLOWLINE
- EXISTING - TOP BACK OF CURB LINE
- EXISTING - CONCRETE SIDEWALK
- EXISTING - CULVERT PIPE
- EXISTING - EDGE OF BUILDING
- 3200 — EXISTING - MAJOR CONTOUR LINE WITH CONTOUR LABEL
- EXISTING - MINOR CONTOUR LINE
- EXISTING - DRAINAGE DITCH
- EXISTING - DRAINAGE DITCH CENTERLINE
- EXISTING - CHAIN LINK FENCE
- X — EXISTING - ROUND RAIL FENCE
- EW — EXISTING - UNDERGROUND WATER LINE
- ES — EXISTING - UNDERGROUND GRAVITY SEWER LINE
- EIRR — EXISTING - UNDERGROUND IRRIGATION LINE
- UGP — EXISTING - UNDERGROUND POWER LINE
- UGU — EXISTING - UNDERGROUND COMMUNICATION LINE
- UGT — EXISTING - UNDERGROUND TELEPHONE LINE
- FO — EXISTING - UNDERGROUND FIBER OPTIC LINE
- NG — EXISTING - UNDERGROUND NATURAL GAS LINE
- EXISTING - CONCRETE HATCH & CONCRETE EDGE
- EXISTING - ASPHALT HATCH & ASPHALT EDGE
- EXISTING - GRAVEL/DIRT HATCH & GRAVEL/DIRT EDGE

PROPOSED - LINE TYPES

- PROPOSED - EDGE OF ASPHALT
- PROPOSED - SLOPE STAKE LIMIT
- PROPOSED - CHAIN LINK FENCE
- PROPOSED - TOP BACK OF CURB LINE
- PROPOSED - CONCRETE SIDEWALK
- SW 12" — PROPOSED - 12" Ø STORM PIPE
- PROPOSED - MAJOR CONTOUR LINE WITH CONTOUR LABEL
- PROPOSED - MINOR CONTOUR LINE
- PROPOSED - CONCRETE HATCH & CONCRETE EDGE
- PROPOSED - ASPHALT HATCH & ASPHALT EDGE
- PROPOSED - INFILTRATION CELL AREA

SYMBOLS

- EXISTING FIBER OPTIC BOX
- T — EXISTING TELEPHONE/COMMUNICATIONS PEDESTAL
- GM — EXISTING GAS METER
- EXISTING STORM CURB INLET
- WV — EXISTING WATER VALVE
- EXISTING WATER HYDRANT
- W — EXISTING WATER MANHOLE
- EXISTING IRRIGATION WATER FILL STATION
- ICV — EXISTING IRRIGATION WATER VALVE
- EXISTING IRRIGATION SPRINKLER HEAD
- EXISTING UTILITY MARKER
- EXISTING FLAGPOLE
- EXISTING SIGN (SINGLE POST)
- EXISTING POST
- EXISTING BOLLARD
- EXISTING GUY WIRE
- EXISTING DECIDUOUS TREE
- EXISTING CONIFEROUS TREE
- EXISTING BORING LOCATION
- SET 3/8" REBAR WITH B.P.C.
- EXISTING OVERHEAD UTILITY POLE
- EM — EXISTING ELECTRIC METER
- E — EXISTING ELECTRIC PEDESTAL OR JUNCTION BOX
- E — EXISTING ELECTRIC TRANSFORMER
- E — EXISTING ELECTRIC MISC - OUTLET OR OTHER MISC. ELECTRIC
- EXISTING LIGHT POLE (UNLESS NOTED OTHERWISE)

ABBREVIATIONS

AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION
ADA	AMERICAN DISABILITY ACT
AC	ACRE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AVE.	AVENUE
CF	CUBIC FEET
C.O.B.	CITY OF BOZEMAN
CP	CONTROL POINT
DIA, Ø	DIAMETER
EG	EXISTING GRADE
EL/ELEV	ELEVATION
FG	FINISH GRADE
FT	FEET/FOOT
FWP	FISH, WILDLIFE, AND PARKS
HDPE	HIGH DENSITY POLYETHYLENE
HEX	HEXAGON
INV.	INVERT
LF	LINEAR FOOT
MAX	MAXIMUM
MIN	MINIMUM
MPWSS	MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS
MSU	MONTANA STATE UNIVERSITY
MT	MONTANA
NAD	NORTH AMERICAN DATUM
NAVD	NORTH AMERICAN VERTICAL DATUM
NTS	NOT TO SCALE
R	RADIUS
S	SOUTH
SF	SQUARE FEET (FOOT)
TYP.	TYPICAL
TBC	TOP BACK OF CURB
QTY	QUANTITY

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RECONSTRUCTION OF PARKING LOT 21
CONSTRUCTION DOCUMENTS

DJ&A

DRAWN BY: V. NEARY
REVIEWED BY: S. ESLINGER

REV.	DESCRIPTION	DATE

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NOTES, LEGEND, & ABBREVIATIONS

SHEET
GI0.2

DATE
04-30-2026

	NAD 83 (2011)(EPOCH:2010.0000)		GEOID 18			
	MONTANA STATE PLANE ZONE (2500)		NAVD 88	MODIFIED GROUND PLANE		
POINT	NORTHING INTERNATIONAL FEET	EASTING INTERNATIONAL FEET	ELEV. US SURVEY FEET	LATITUDE	LONGITUDE	DESCRIPTION
CP-7	519563.36	1569526.03	4900.73	N45°39'50.52708"	W111°03'39.93005"	SET #5 REBAR WITH RPC
CP-8	519597.84	1569185.64	4900.94	N45°39'50.80044"	W111°03'44.73309"	SET #5 REBAR WITH RPC
CP-9	520092.63	1569150.25	4893.34	N45°39'55.67894"	W111°03'45.37046"	SET #5 REBAR WITH RPC

BASIS OF BEARING AND COORDINATES
MONTANA STATE PLANE
COORDINATE SYSTEM
NAD83(2011) EPOCH 2010.0000
GRID NORTH BASED ON GNSS OBSERVATION
VERTICAL DATUM IS NAVD88
DJ&A, P.C. PROJ. NO. 7869

UNITS FOR DISTANCES AND COORDINATES SHOWN ARE INTERNATIONAL FEET

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PROJECT CONTROL POINT LAYOUT

SHEET

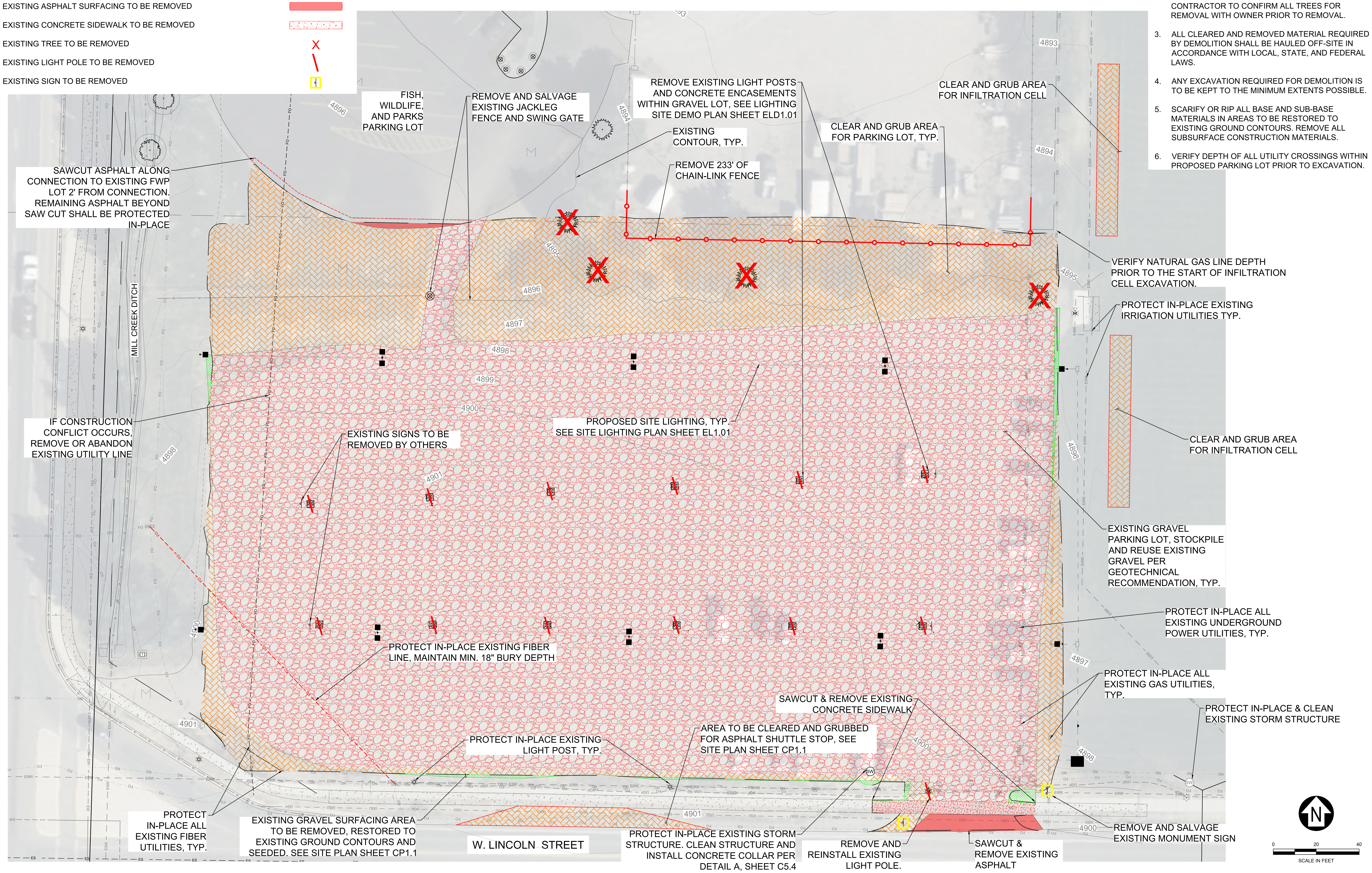
GC1.1

DATE

04-30-2026

LEGEND

EXISTING GRAVEL SURFACING TO BE:	
REMOVED FOR PROPOSED PARKING LOT	(hatch)
REMOVED AND RESTORED TO EXISTING GROUND CONTOURS	(hatch)
AREA TO BE CLEARED AND GRUBBED	(hatch)
EXISTING ASPHALT SURFACING TO BE REMOVED	(hatch)
EXISTING CONCRETE SIDEWALK TO BE REMOVED	(hatch)
EXISTING TREE TO BE REMOVED	X
EXISTING LIGHT POLE TO BE REMOVED	\
EXISTING SIGN TO BE REMOVED	(symbol)



FISH, WILDLIFE, AND PARKS PARKING LOT
REMOVE AND SALVAGE EXISTING JACKLEG FENCE AND SWING GATE
REMOVE EXISTING LIGHT POSTS AND CONCRETE ENCASEMENTS WITHIN GRAVEL LOT, SEE LIGHTING SITE DEMO PLAN SHEET ELD1.01
EXISTING CONTOUR, TYP.
REMOVE 233' OF CHAIN-LINK FENCE
CLEAR AND GRUB AREA FOR PARKING LOT, TYP.
CLEAR AND GRUB AREA FOR INFILTRATION CELL
SAWCUT ASPHALT ALONG CONNECTION TO EXISTING FWP LOT 2' FROM CONNECTION. REMAINING ASPHALT BEYOND SAW CUT SHALL BE PROTECTED IN-PLACE
MILL CREEK DITCH
VERIFY NATURAL GAS LINE DEPTH PRIOR TO THE START OF INFILTRATION CELL EXCAVATION.
PROTECT IN-PLACE EXISTING IRRIGATION UTILITIES TYP.
IF CONSTRUCTION CONFLICT OCCURS, REMOVE OR ABANDON EXISTING UTILITY LINE
EXISTING SIGNS TO BE REMOVED BY OTHERS
PROPOSED SITE LIGHTING, TYP. SEE SITE LIGHTING PLAN SHEET EL1.01
CLEAR AND GRUB AREA FOR INFILTRATION CELL
EXISTING GRAVEL PARKING LOT, STOCKPILE AND REUSE EXISTING GRAVEL PER GEOTECHNICAL RECOMMENDATION, TYP.
PROTECT IN-PLACE ALL EXISTING UNDERGROUND POWER UTILITIES, TYP.
PROTECT IN-PLACE EXISTING FIBER LINE, MAINTAIN MIN. 18" BURY DEPTH
PROTECT IN-PLACE ALL EXISTING GAS UTILITIES, TYP.
SAWCUT & REMOVE EXISTING CONCRETE SIDEWALK
PROTECT IN-PLACE & CLEAN EXISTING STORM STRUCTURE
AREA TO BE CLEARED AND GRUBBED FOR ASPHALT SHUTTLE STOP, SEE SITE PLAN SHEET CP1.1
PROTECT IN-PLACE EXISTING LIGHT POST, TYP.
PROTECT IN-PLACE ALL EXISTING FIBER UTILITIES, TYP.
EXISTING GRAVEL SURFACING AREA TO BE REMOVED, RESTORED TO EXISTING GROUND CONTOURS AND SEEDED. SEE SITE PLAN SHEET CP1.1
W. LINCOLN STREET
PROTECT IN-PLACE EXISTING STORM STRUCTURE. CLEAN STRUCTURE AND INSTALL CONCRETE COLLAR PER DETAIL A, SHEET C5.4
REMOVE AND REINSTALL EXISTING LIGHT POLE.
SAWCUT & REMOVE EXISTING ASPHALT
REMOVE AND SALVAGE EXISTING MONUMENT SIGN
4893
4894
4895
4896
4897
4898
4899
4900
4901
N
0
20
40
SCALE IN FEET

DEMOLITION PLAN NOTES:

1. CONTRACTOR TO SUPPLY SALVAGED ITEMS TO OWNER.
2. PROTECT ALL EXISTING TREES IN PLACE UNLESS OTHERWISE SHOWN. ALL TREES PRESENT MAY NOT BE SHOWN. CONTRACTOR TO INFORM OWNER OF ANY TREES THAT MAY BE IN CONFLICT, IF NOT CALLED OUT ON THESE PLANS. CONTRACTOR TO CONFIRM ALL TREES FOR REMOVAL WITH OWNER PRIOR TO REMOVAL.
3. ALL CLEARED AND REMOVED MATERIAL REQUIRED BY DEMOLITION SHALL BE HAULED OFF-SITE IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL LAWS.
4. ANY EXCAVATION REQUIRED FOR DEMOLITION IS TO BE KEPT TO THE MINIMUM EXTENTS POSSIBLE.
5. SCARIFY OR RIP ALL BASE AND SUB-BASE MATERIALS IN AREAS TO BE RESTORED TO EXISTING GROUND CONTOURS. REMOVE ALL SUBSURFACE CONSTRUCTION MATERIALS.
6. VERIFY DEPTH OF ALL UTILITY CROSSINGS WITHIN PROPOSED PARKING LOT PRIOR TO EXCAVATION.

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RECONSTRUCTION OF PARKING LOT 21

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DJ&A

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DEMOLITION PLAN

SHEET
CD1.1

DATE
04-30-2026

"NO PARKING FIRE LANE" CURB MARKING, TYP. SEE DETAIL E SHEET C5.3

FISH, WILDLIFE, & PARKS PARKING LOT

EDGE OF BUFFER ZONE, TYP.

CONTRACTOR TO TIE TO EXISTING ASPHALT , SEE GRADING PLAN SHEET CG1.1

INSTALL 2' WIDE VALLEY GUTTER PER DETAIL B SHEET C5.1

CURB CUT TO TRANSITION CURB AND GUTTER TO VALLEY GUTTER, SEE DETAIL F SHEET C5.1

SLOPE STAKE LIMIT, TYP

EXISTING GROUND CONTOUR, TYP.

STORMWATER INFILTRATION CELL, SEE SHEET CU1.1

INSTALL 210 LF CHAIN LINK FENCE

LEVEL SLOPE WITH SALVAGED GRAVEL SURFACING

COMBINATION MANHOLE AND CURB INLET TYPE B, SEE DETAIL C SHEET C5.4

PROPERTY LINE, TYP.

R2.75'

39.0' TYP.

18.0'

YELLOW CURB PAINT

STRIPE "NO PARKING" AREAS, AS SHOWN IN PLANS, TYP. ALL AREAS SHOWN WITH HATCH STRIPING

COMBINATION MANHOLE AND CURB INLET TYPE A, SEE DETAIL C SHEET C5.4

CURB CUT, SEE DETAIL F SHEET C5.1

INSTALL SIGN, "NO PARKING" PER DETAIL B SHEET C5.4

CURB CUT, SEE DETAIL F SHEET C5.1

STORMWATER INFILTRATION CELL, SEE SHEET CU1.1

24.0'

INSTALL SIGN, "NO PARKING" PER DETAIL B SHEET C5.4

20.0'

CATCH CURB AND GUTTER, TYP. SEE DETAIL A SHEET C5.1

COMBINATION MANHOLE AND CURB INLET TYPE B, SEE DETAIL C SHEET C5.4

CURB CUT, SEE DETAIL F SHEET C5.1

PROPOSED SITE LIGHTING, TYP. SEE SITE LIGHTING PLAN SHEET EL1.01

COMBINATION MANHOLE AND CURB INLET TYPE B, SEE DETAIL C SHEET C5.4

CONCRETE PARKING BLOCK, TYP. SEE DETAIL F, SHEET C5.3

INSTALL 2' WIDE VALLEY GUTTER PER DETAIL B SHEET C5.1

CURB CUT, SEE DETAIL F SHEET C5.1

ACCESSIBLE PARKING STALLS, TYP SEE DETAIL B SHEET C5.3

INSTALL ACCESSIBLE PARKING SIGNS PER DETAIL B SHEET C5.4

PAVEMENT MARKINGS, TYP. SEE DETAIL A SHEET C5.3

YELLOW CURB PAINT

INSTALL SIGN, "NO PARKING" PER DETAIL B SHEET C5.4

SPILL CURB AND GUTTER, TYP. SEE DETAIL A SHEET C5.1

ADJUST MANHOLE TO GRADE, SEE DETAIL A SHEET C5.4

PROTECT IN-PLACE & CLEAN EXISTING STORM STRUCTURE

CURB CUT, SEE DETAIL F SHEET C5.1

R2.75'

21.8'

9.0' TYP.

5.0'

5.0'

R4

R3.25

REINSTALL MONUMENT SIGN

9.0'

R6'

9.0'

R2.75'

50.0'

44.4'

R2.78'

INSTALL ACCESSIBLE PARKING SIGNS PER DETAIL B SHEET C5.4

6.0'

5.8'

R23'

R15'

PROTECT-IN-PLACE EXISTING SIDEWALK, TYP.

LEVEL AND SEED SLOPE

30.5'

41.1'

9.2'

119.0'

INSTALL ASPHALT PAD SHUTTLE STOP, SEE DETAIL E SHEET C5.1

INSTALL NEW CONCRETE CURB RAMP, SEE DETAIL C SHEET C5.3. TIE TO EXISTING CONCRETE SIDEWALK AT CLEAN SAWCUT LINE

CONTRACTOR TO TIE TO EXISTING ASPHALT AT SAWCUT LINE, SEE GRADING PLAN SHEET CG1.1

0 20 40

SCALE IN FEET

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SITE PLAN

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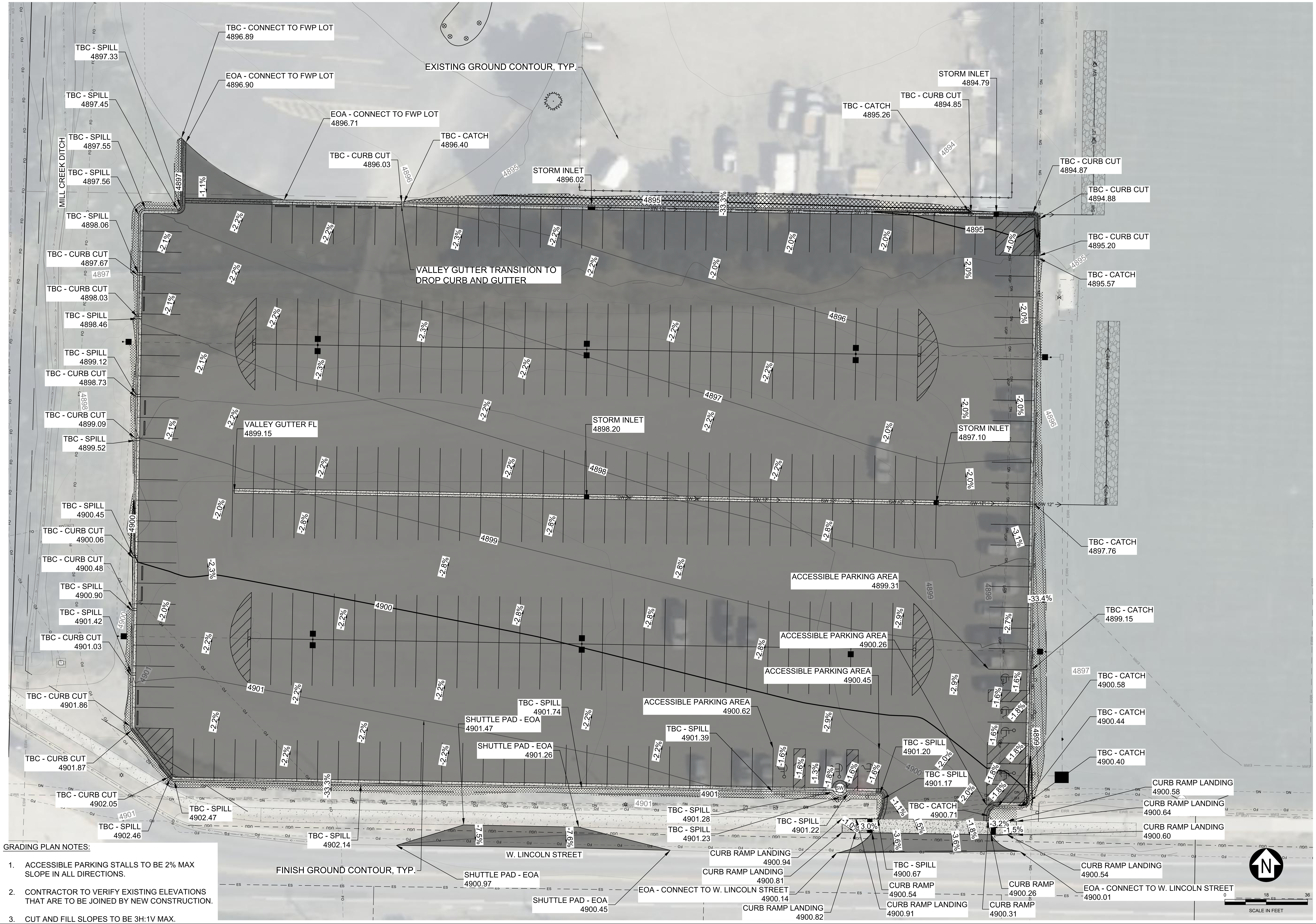

GRADING PLAN NOTES:

1. ACCESSIBLE PARKING STALLS TO BE 2% MAX SLOPE IN ALL DIRECTIONS.
2. CONTRACTOR TO VERIFY EXISTING ELEVATIONS THAT ARE TO BE JOINED BY NEW CONSTRUCTION.
3. CUT AND FILL SLOPES TO BE 3H:1V MAX.

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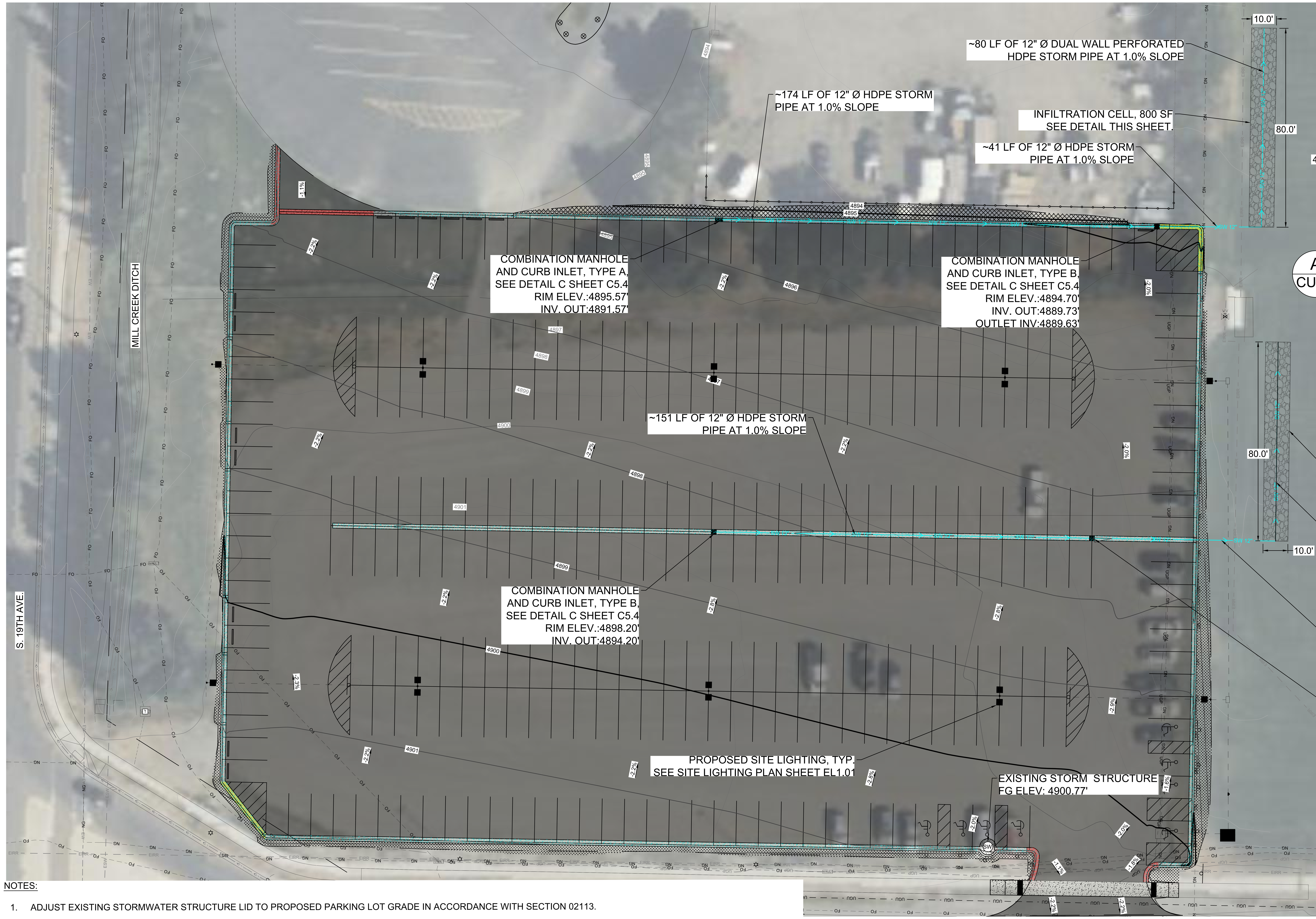

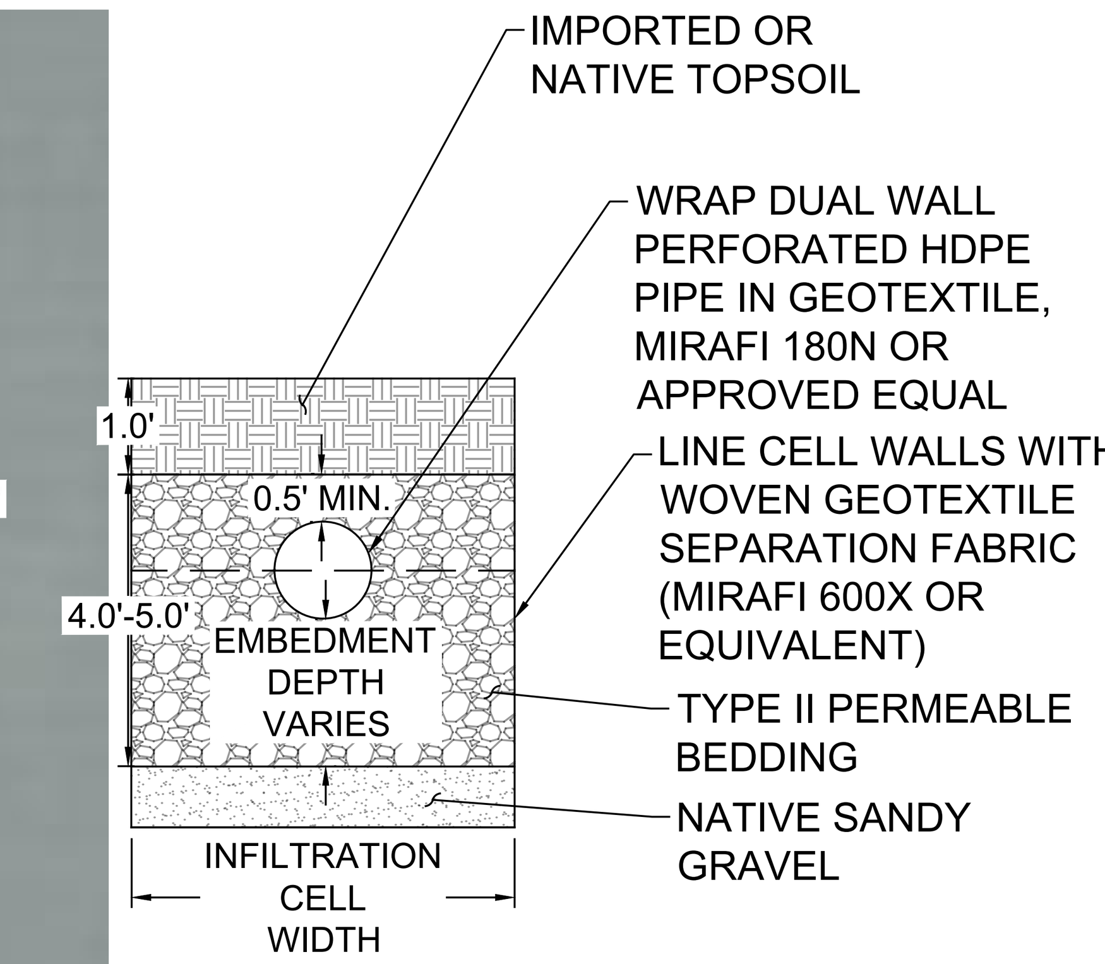

A CU1.1 INFILTRATION CELL SECTION

NTS

INFILTRATION CELL NOTES:

1. INSTALL AND COMPACT CLASS II PERMEABLE BASE COURSE IN MAX. 6" LIFTS. LEVEL FINAL GRADE BY HAND.
2. COMPACT PIPE EMBEDMENT WITH ATLEAST TWO PASSES OF COMPACTION EQUIPMENT.
3. WORK AROUND PIPE BY HAND TO PROVIDE UNIFORM SUPPORT.
4. FINAL BACKFILL SHALL BE COMPACTED TO 85% PROCTOR DENSITY.

NOTES:

1. ADJUST EXISTING STORMWATER STRUCTURE LID TO PROPOSED PARKING LOT GRADE IN ACCORDANCE WITH SECTION 02113.
2. ENSURE ALL UTILITY STRUCTURES WITHIN THE PROPOSED TRAVEL WAY ARE TRAFFIC RATED.
3. CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY IF ANY UTILITY CONFLICT IS DISCOVERED AND DEEMED TO BE UNABLE TO FIELD FIT PER SPECIFICATIONS.
4. INFILTRATION CELLS SHALL HAVE A MINIMUM SETBACK OF 5' FROM TBC AND IRRIGATION LINES, AND A 10' MINIMUM OFFSET FROM NATURAL GAS LINES.
5. EXCAVATE INFILTRATION CELL BOTTOM SURFACE TO REACH NATIVE SANDY GRAVEL BEGINNING AT ~4' BELOW EG. MINIMUM INFILTRATION CELL DEPTH IS 5'..
6. INFILTRATION CELLS ARE SIZED FOR 10-YR 2 HOUR DESIGN STORM.
7. CATCHMENT AREA CHARACTERISTICS:

AREA:	2.32 AC
DESIGN VOLUME:	6,087 CF
STORAGE PROVIDED:	6,400 CF

8. PERFORATED DUAL WALL HDPE STORM PIPE OUTLET SHALL BE CAPPED.

N

0 20 40
SCALE IN FEET

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FAX: 406.994.5665

RECONSTRUCTION OF PARKING LOT 21

CONSTRUCTION DOCUMENTS

DJ&A

DRAWN BY: V. NEARY
REVIEWED BY: S. ESLINGER

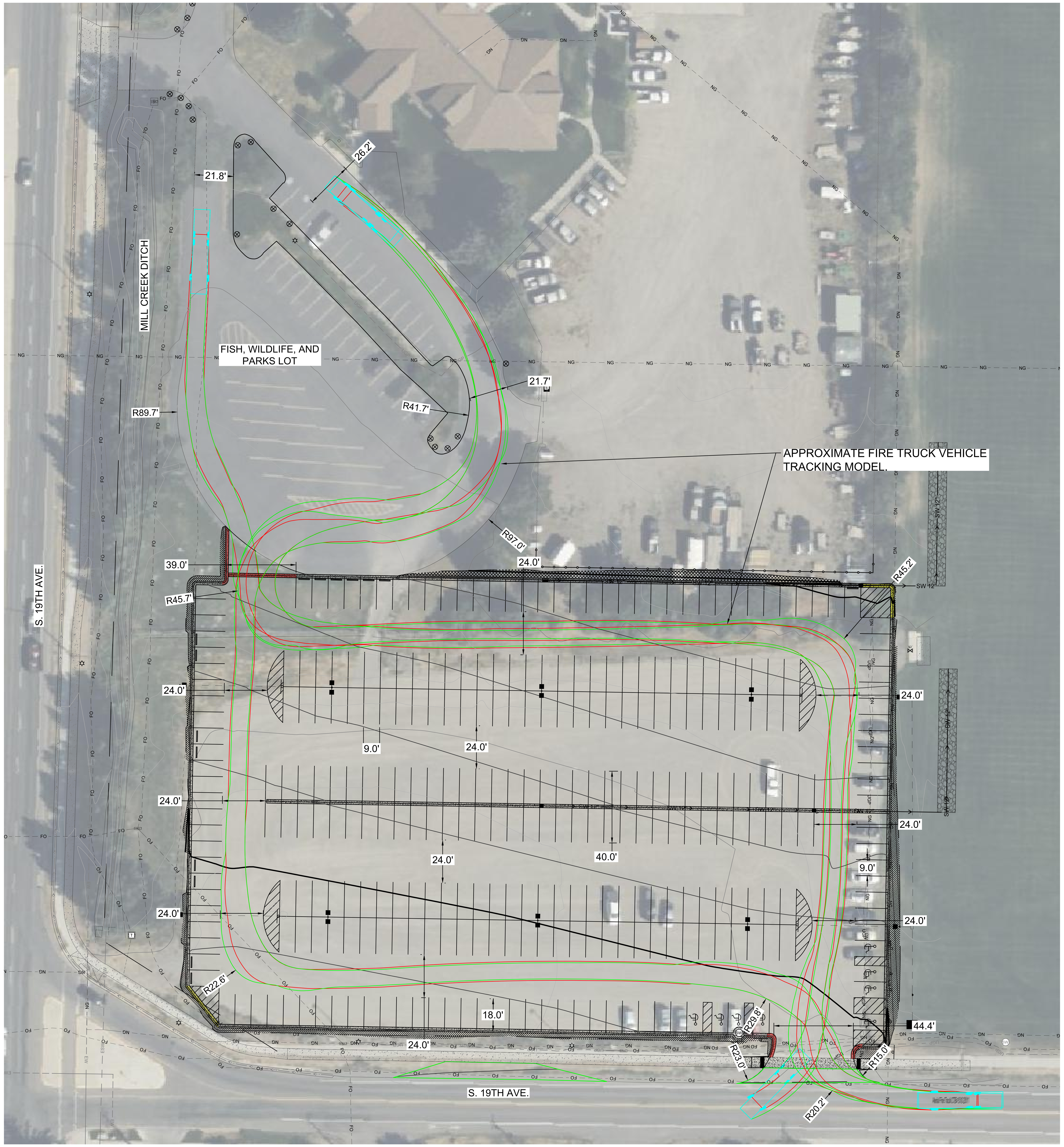
REV.	DESCRIPTION	DATE

PPA#25-1374

UTILITY PLAN

SHEET
CU1.1

DATE
04-30-2026



VEHICLE TURNING MOVEMENT NOTES:

1. FIRE TRUCK SHOWN IS A 2011 AERIAL TOWER TRUCK (CTB-1510)

   VEHICLE DIMENSIONS
   LENGTH: 47.08'
   WIDTH: 8.67'

2. VEHICLE TRACKING IS SHOWN IN COLOR TO CONVEY THE PATH OF TRAVEL:

   GREEN = FRONT BUMPER PATH
   RED = WHEEL PATH

0 30 60
SCALE IN FEET

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RECONSTRUCTION OF PARKING LOT 21
CONSTRUCTION DOCUMENTS

DJ&A

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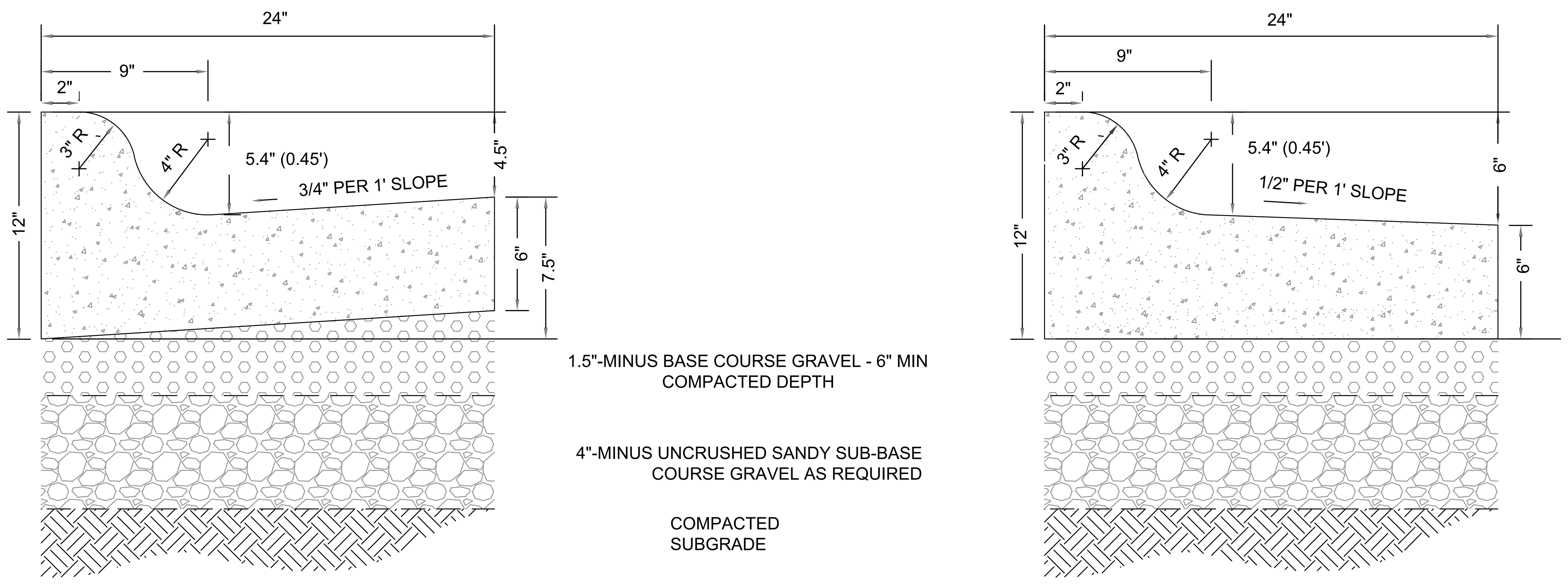
REV.	DESCRIPTION	DATE

PPA#25-1374

TURNING MOVEMENTS

SHEET
CT1.1

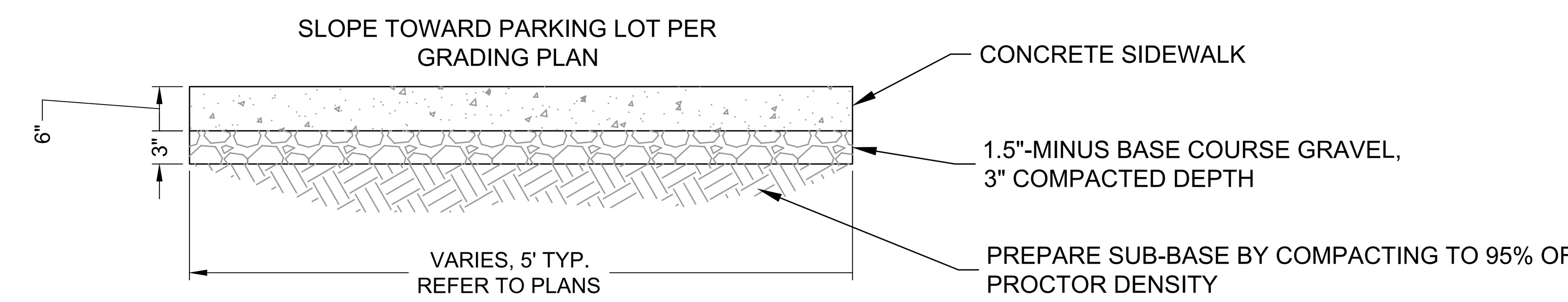
DATE
04-30-2026



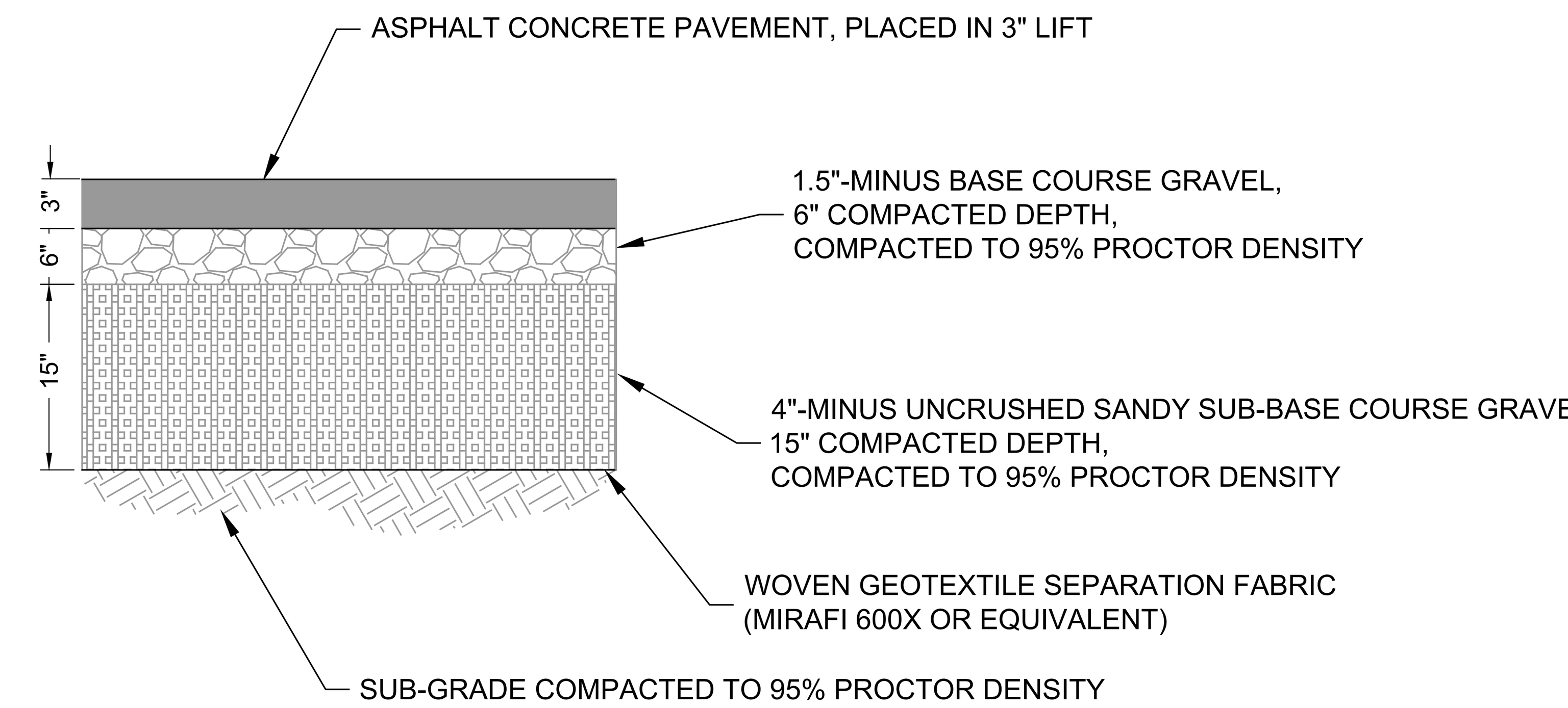
CATCH CURB

SPILL CURB

A CURB & GUTTER
C5-1 NTS



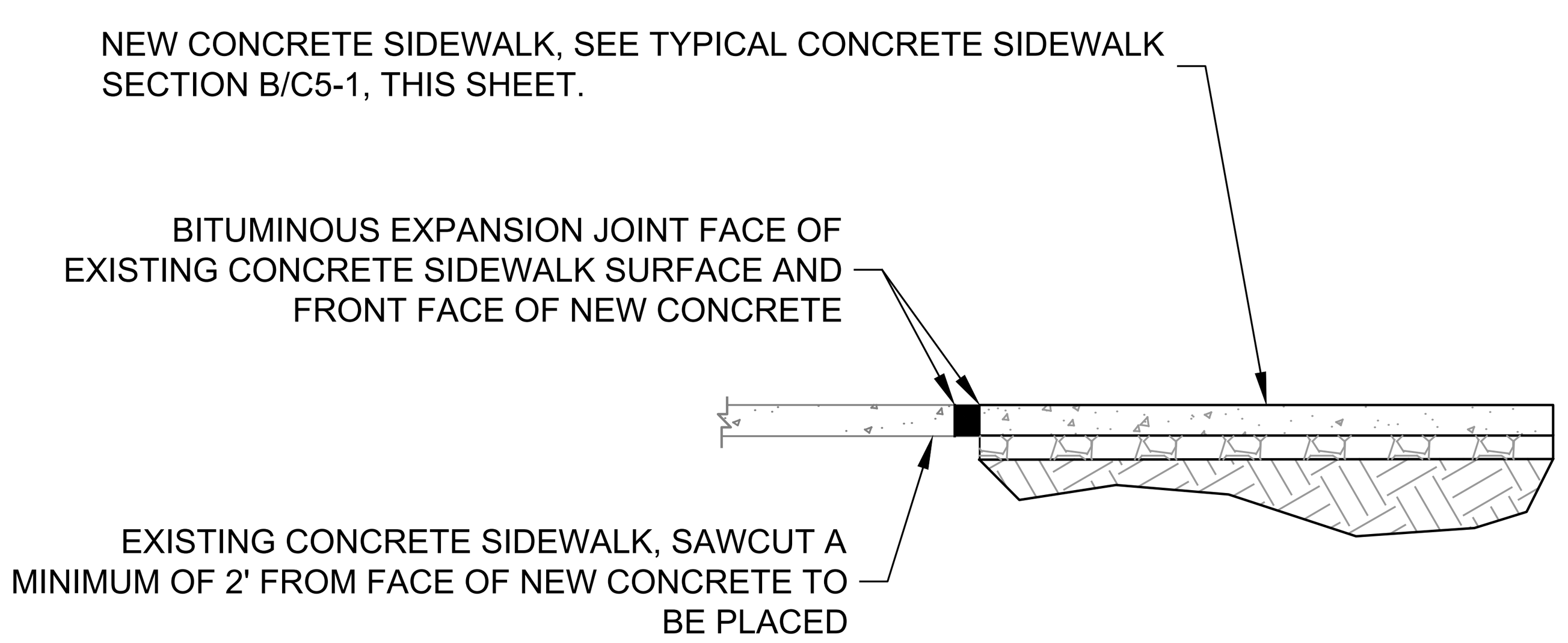
B TYPICAL CONCRETE SIDEWALK SECTION
C5-1 NTS



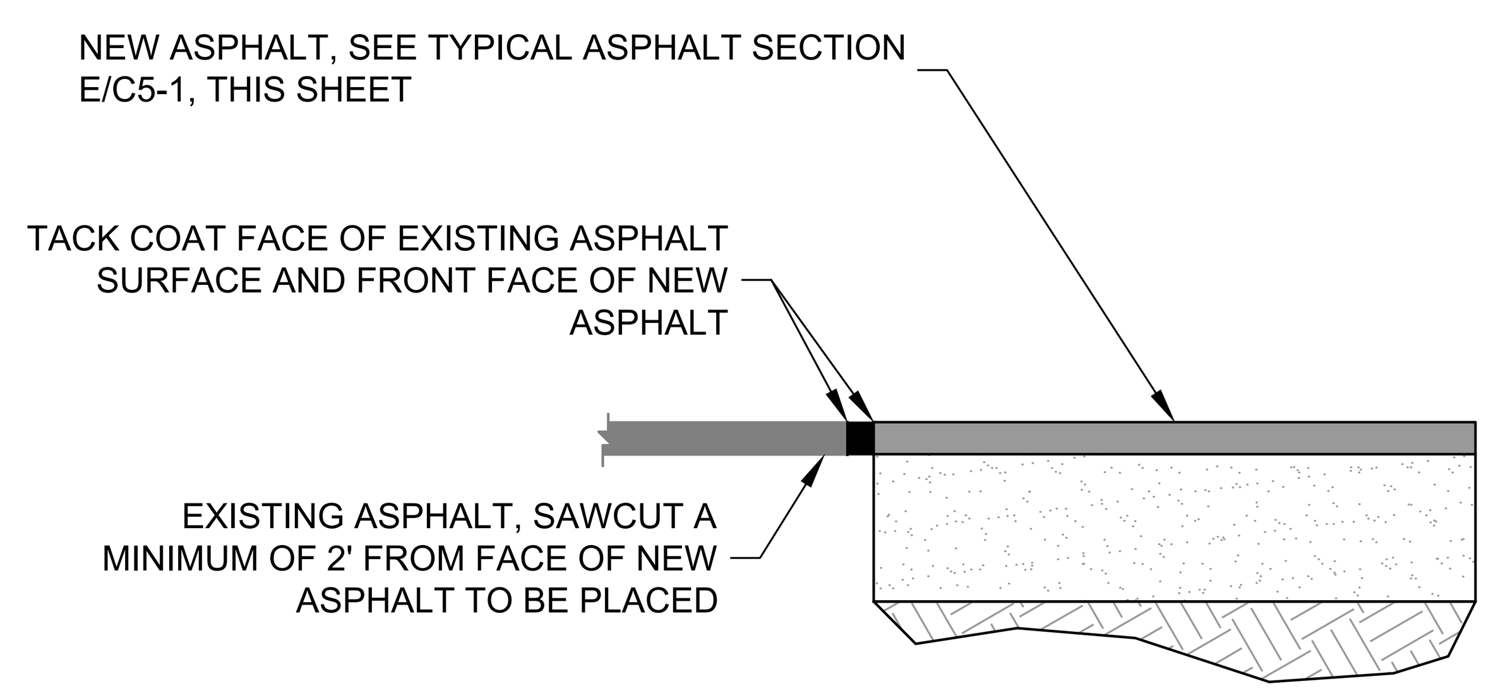
E TYPICAL ASPHALT SECTION
C5-1 NTS

NOTES:

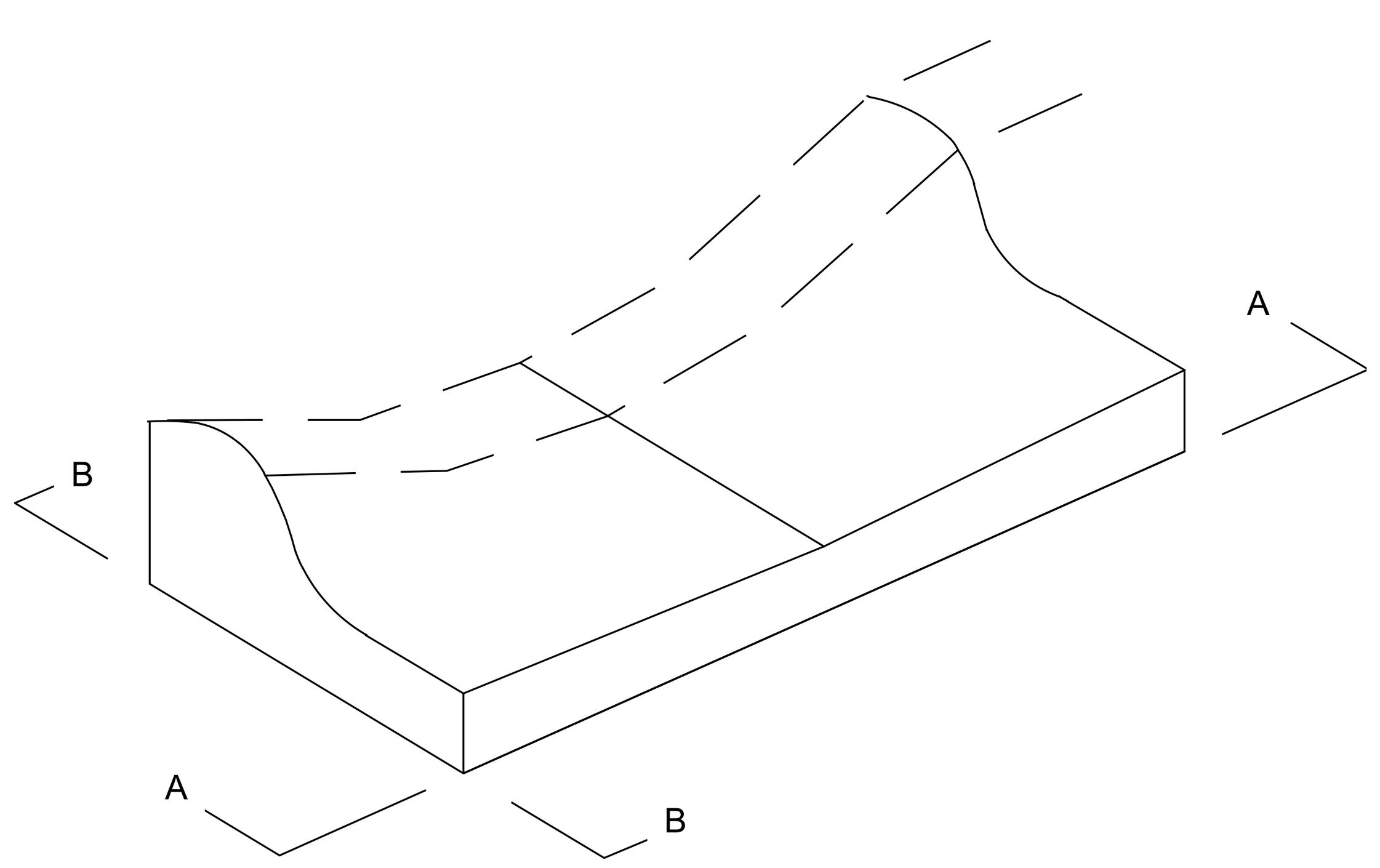
1. OVERLAP GEOTEXTILE A MINIMUM OF 2' AT THE ENDS AND SIDES OF ADJOINING SHEETS OR SEW GEOTEXTILE JOINTS ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS. SEE SECTION 02110.

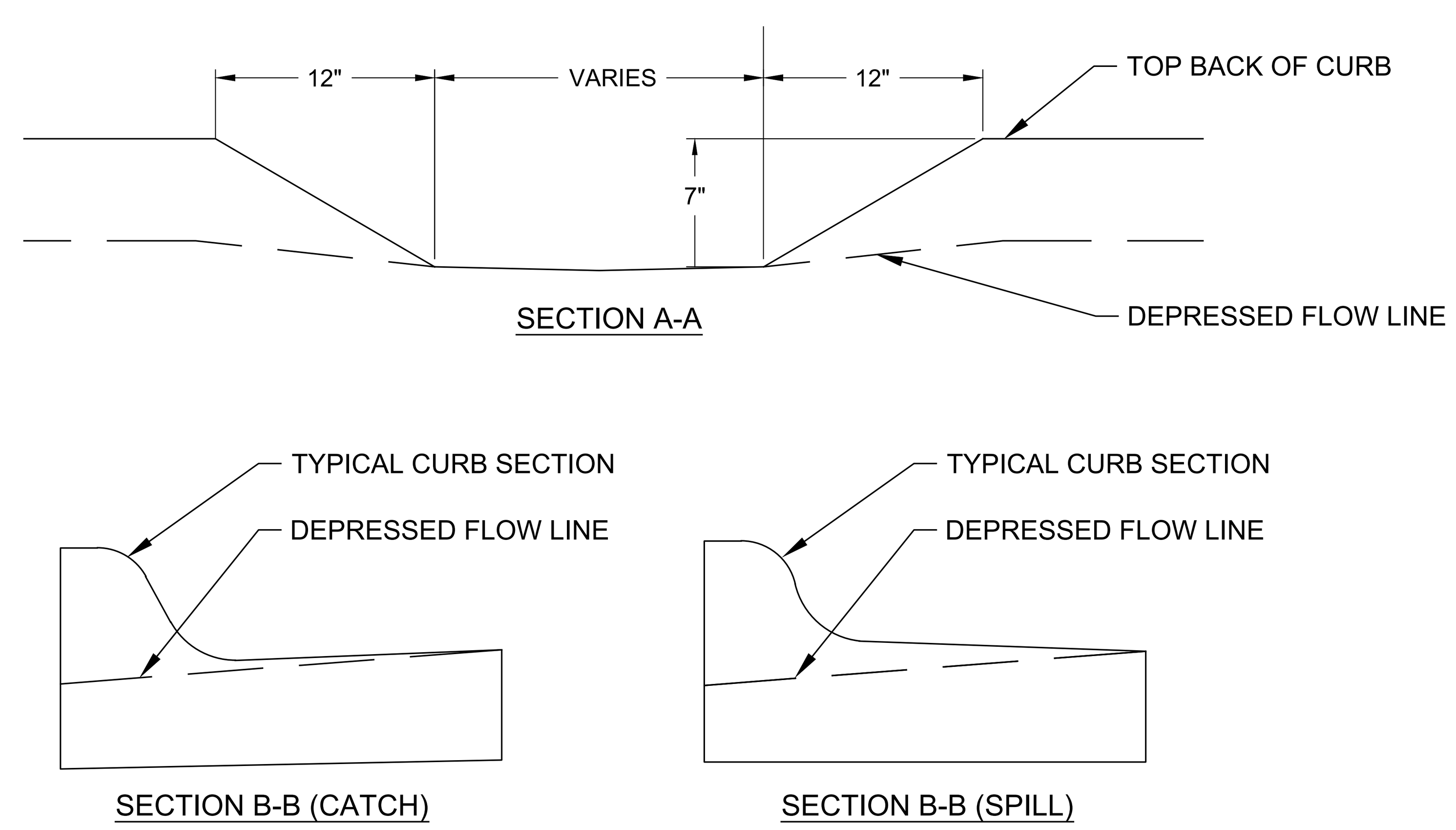


C TYPICAL CONCRETE CUT
C5-1 NTS



D TYPICAL ASPHALT CUT
C5-1 NTS



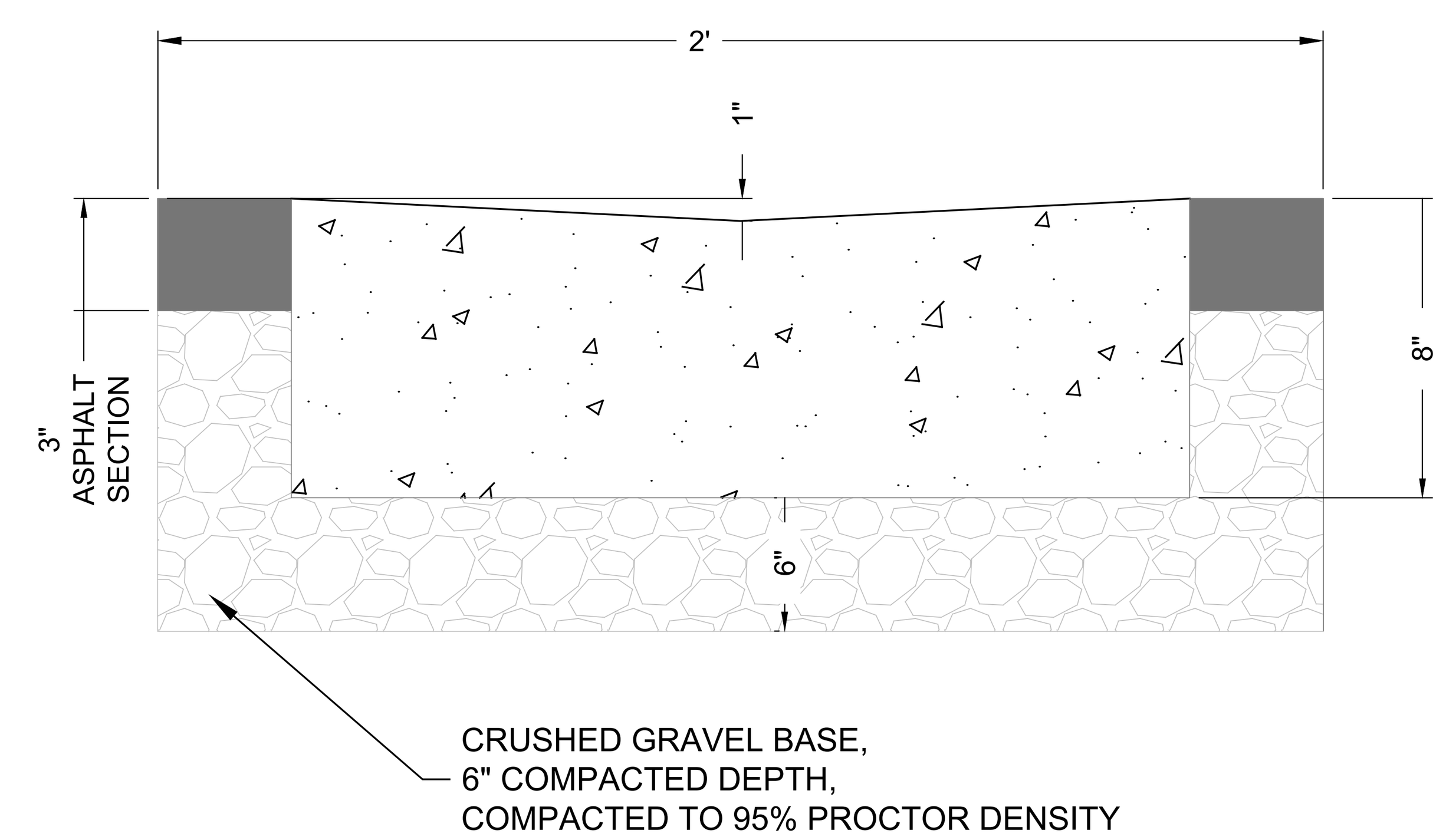


CURB CUT NOTES:

1. CURB AND GUTTER TO BE CONSTRUCTED IN COMPLIANCE WITH MPWSS AND C.O.B. STANDARD DRAWING 02528-1

2. FINAL GRADE SHALL NOT EXTEND ABOVE CURB FLOW LINE OUTLET.

F CURB CUT
C5-1 NTS



G CONCRETE VALLEY GUTTER SECTION
C5-1 NTS

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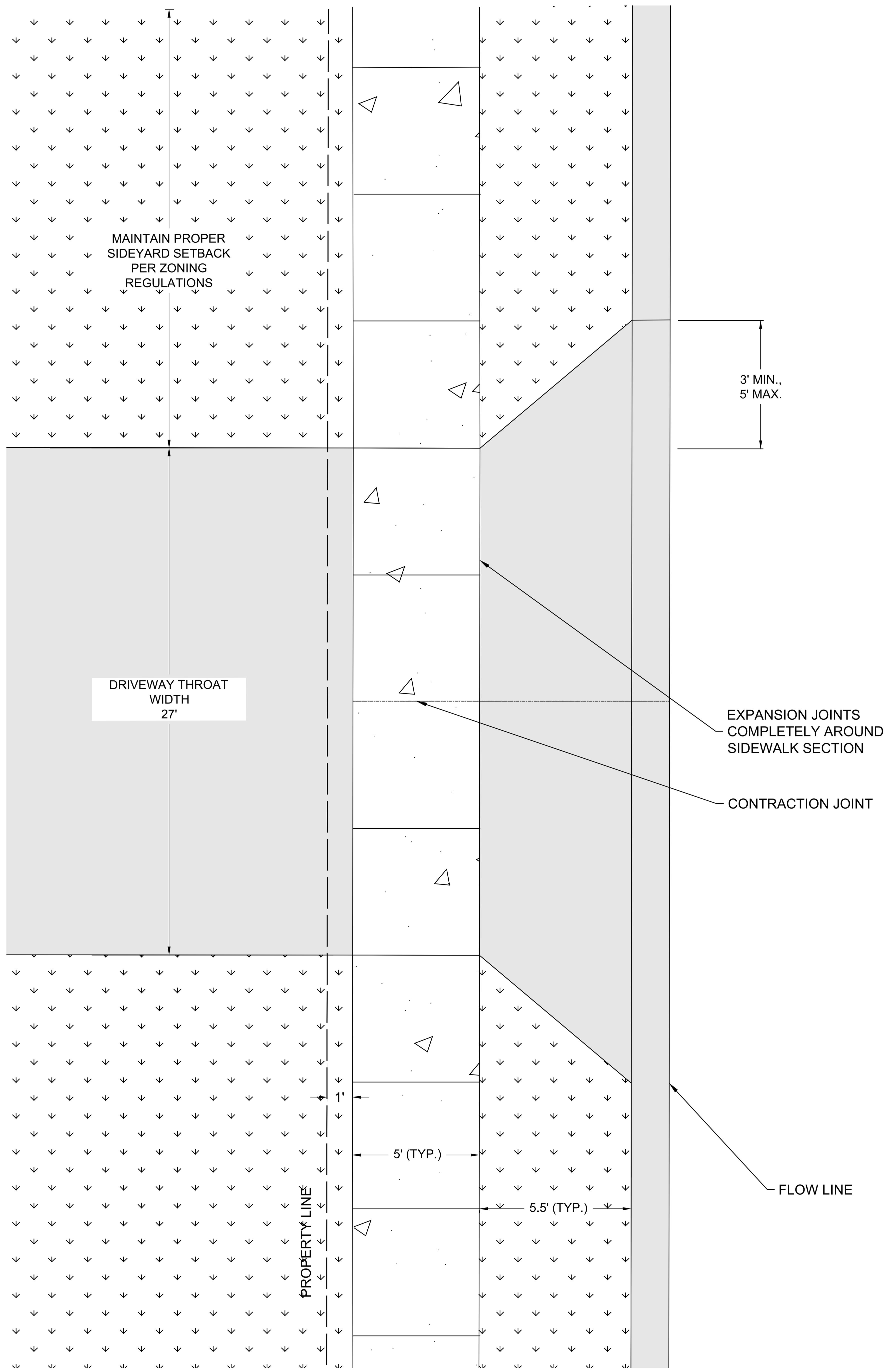
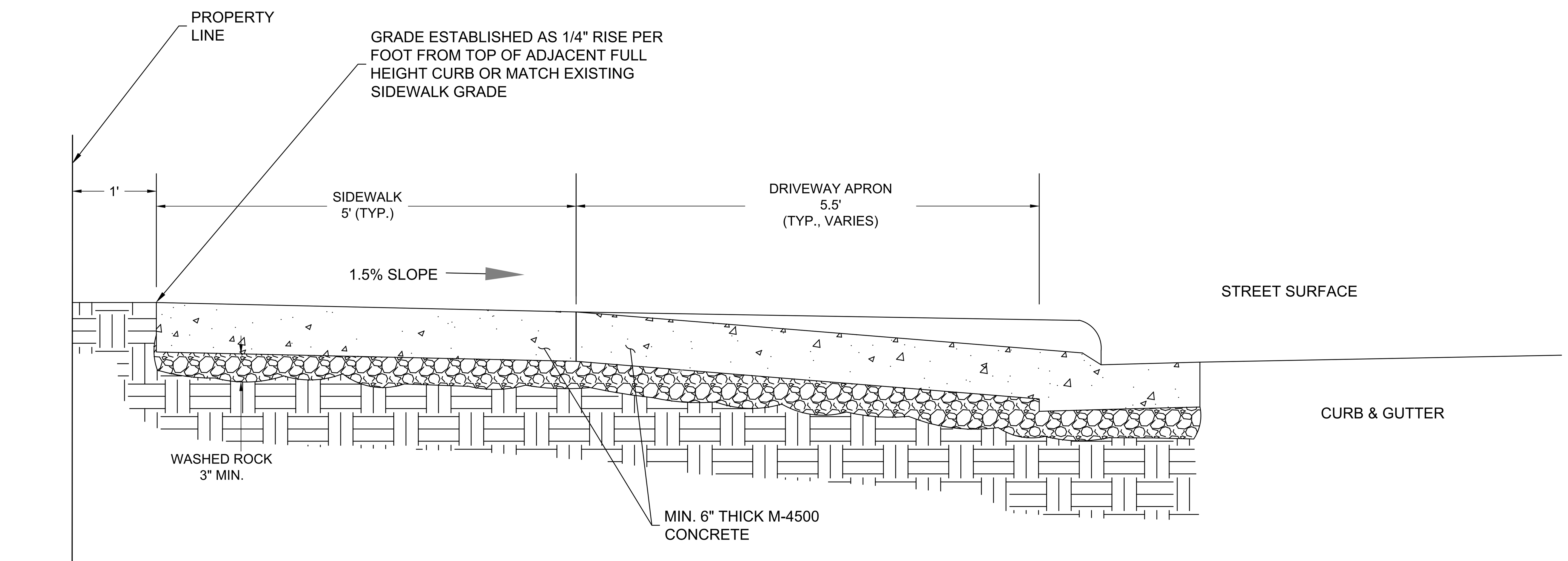
PPA#25-1374

DETAILS 1

SHEET C5.1

DATE 04-30-2026





SECTION

NOTES:

1. SIDEWALK CONTRACTION JOINTS SPACED AT 5' INTERVALS - MIN. DEPTH 1". EXPANSION JOINTS TO BE PLACED AT 25' INTERVALS.
2. EXPANSION JOINT MATERIALS SHALL BE 1/2" THICK PRE-FORMED BITUMINOUS TREATED FIBERBOARD FILLER.

A / C5.2 DRIVEWAY APPROACH
NTS

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RECONSTRUCTION OF PARKING LOT 21

CONSTRUCTION DOCUMENTS

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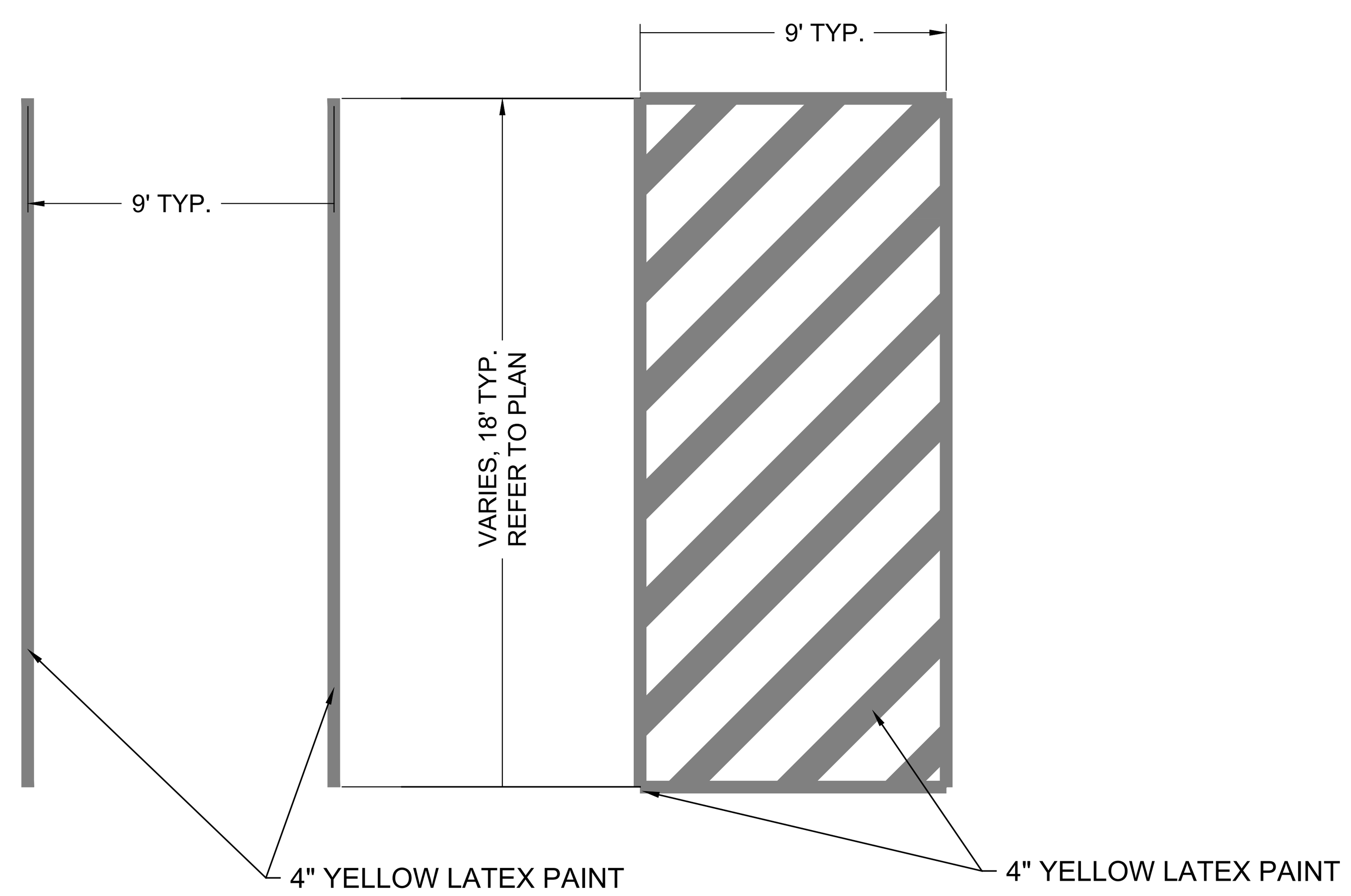
REV.	DESCRIPTION	DATE

PPA#25-1374

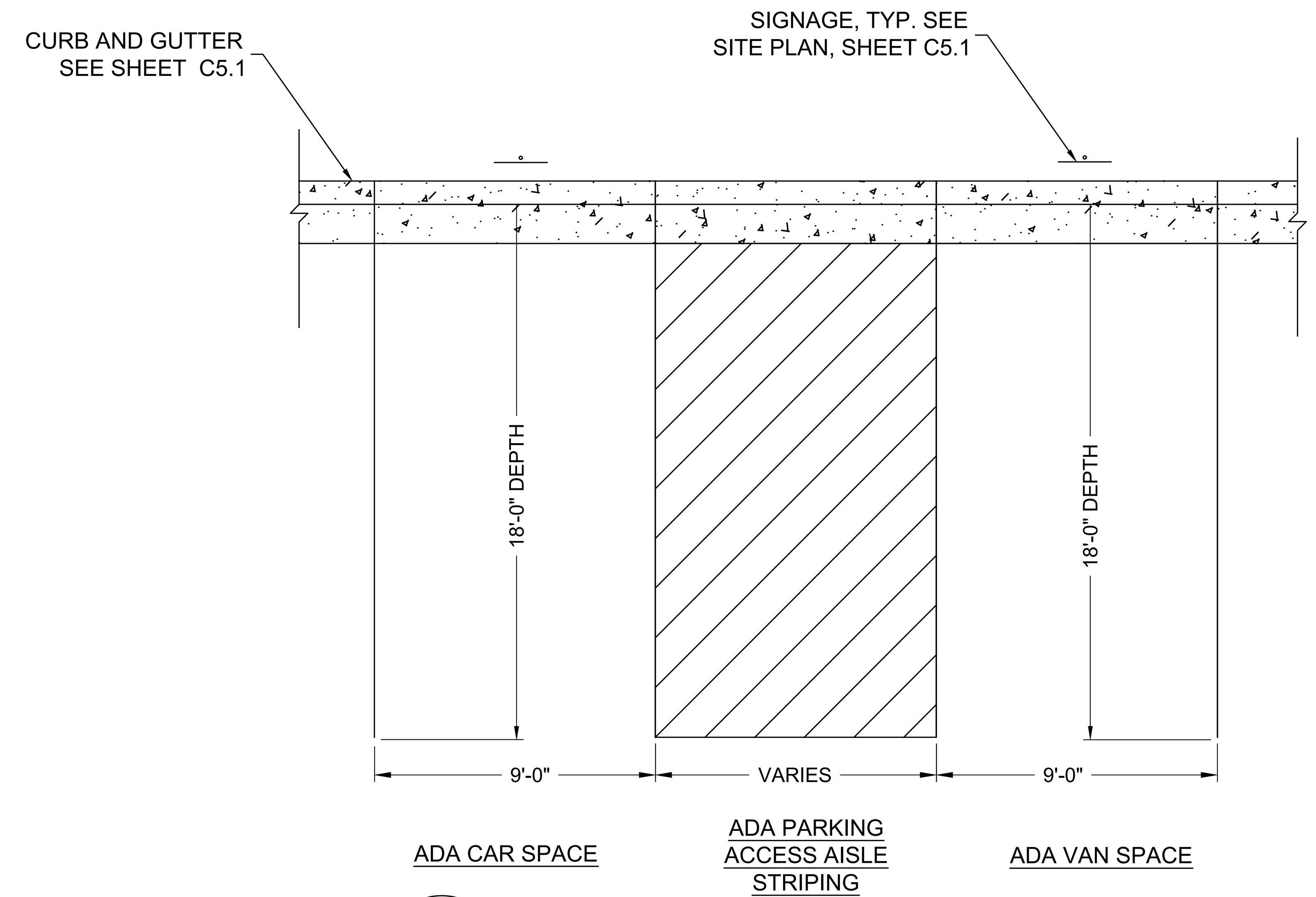
DRIVEWAY APPROACH DETAILS

SHEET
C5.2

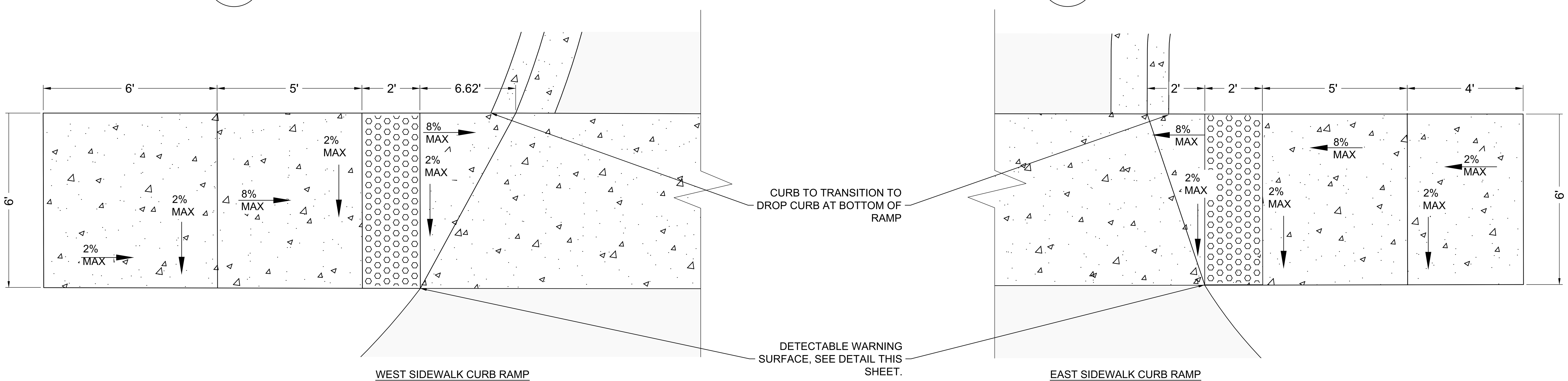
DATE
04-30-2026



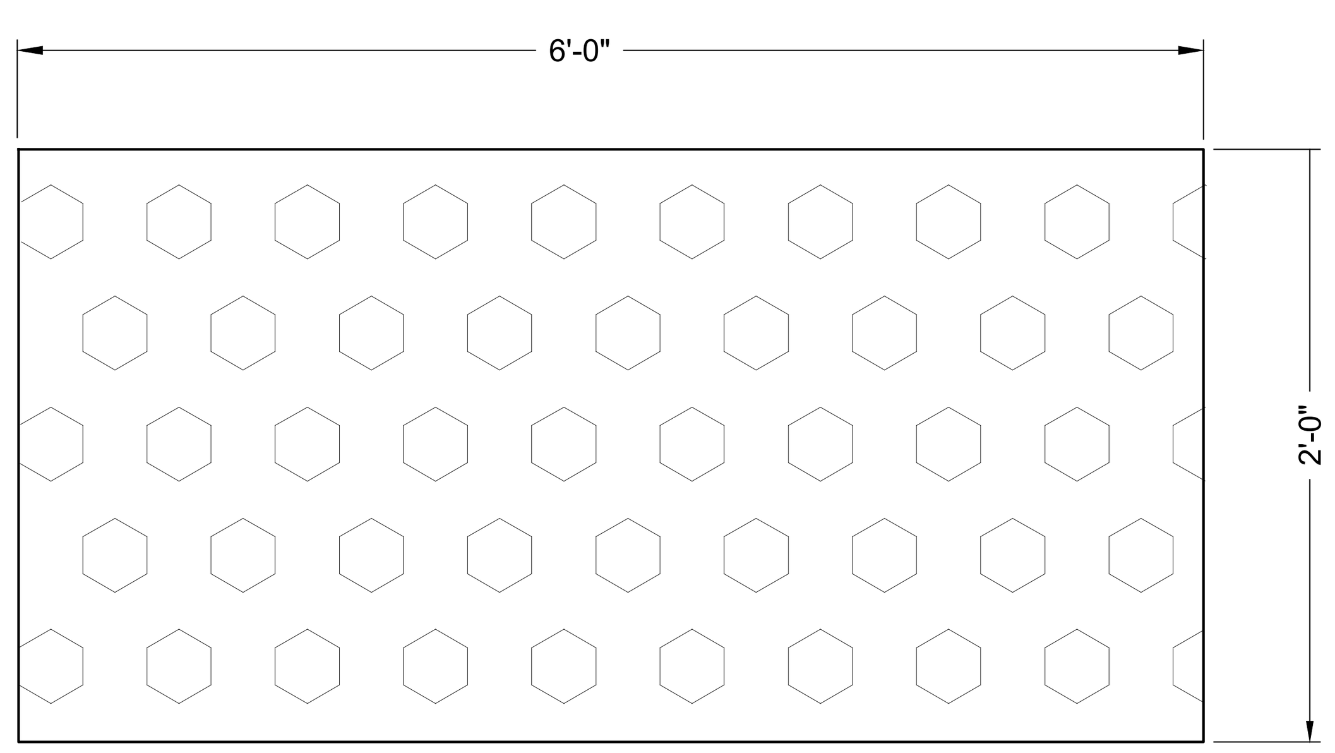
A TYPICAL PAVEMENT MARKINGS
C5.3 NTS



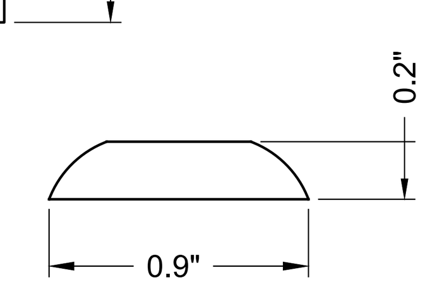
B ADA STALL PAVEMENT MARKINGS
C5.3 NTS



C SIDEWALK CURB RAMP DETAILS
C5.3 NTS



THE DETECTABLE WARNING SURFACE SHALL EXTEND THE FULL LENGTH OF THE CURB PER PLANS. IT SHALL BE A CONTRASTING COLOR AND MEET THE DIMENSIONS SHOWN OF THE TRUNCATED DOME



DETECTABLE WARNING SURFACE

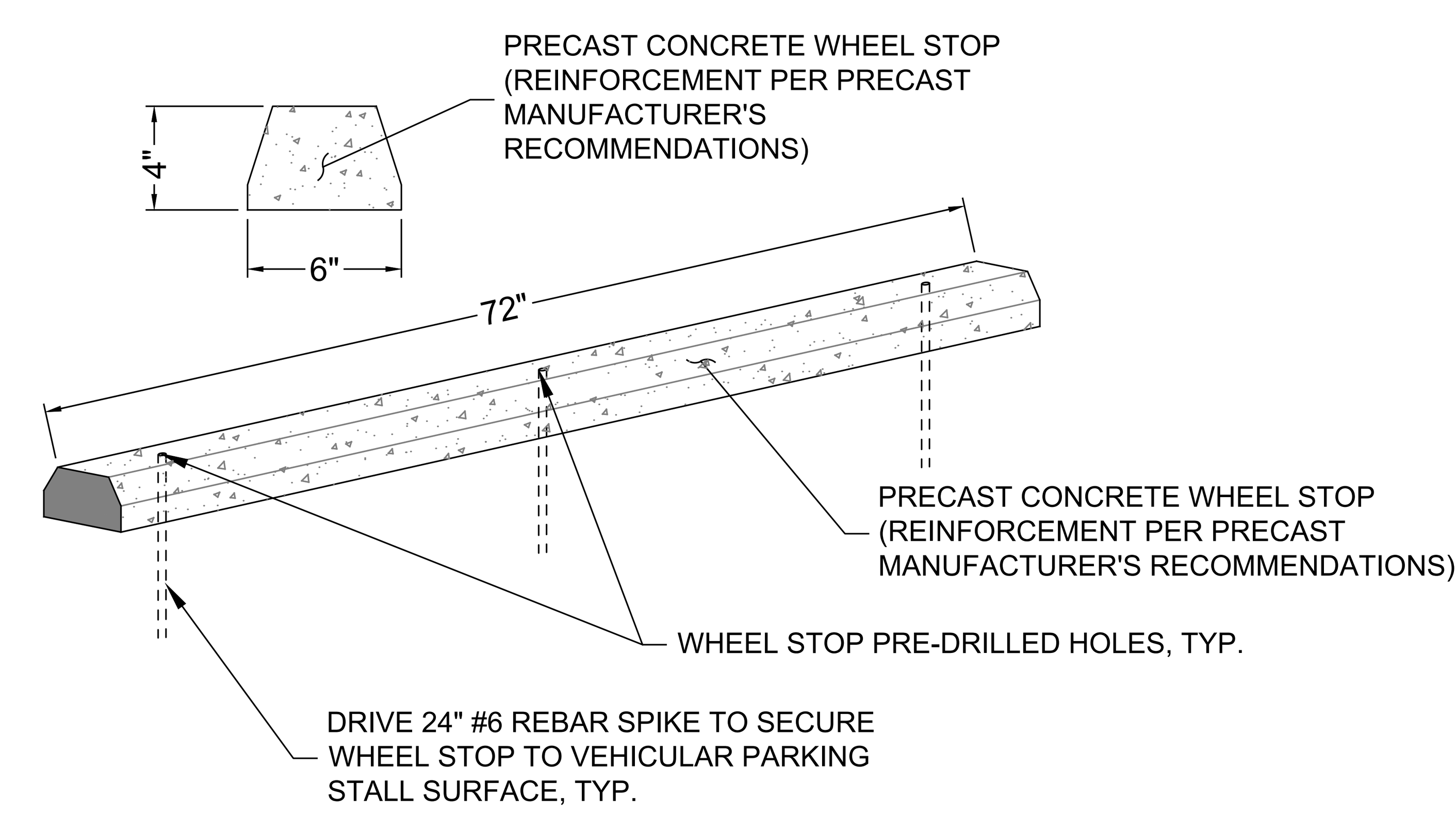
TRUNCATED DOME

D DETECTABLE WARNING DETAIL
C5.3 NTS

NOTE:

1. FIRE LANE CURB LETTERING SHALL BE WHITE, 3" IN HEIGHT WITH A MINIMUM OF 0.5" STROKE.
2. FIRE LANE CURB LETTERING SHALL BE PAINTED ON THE FACE OF THE CURB.
3. A COMPLETE SET OF STENCILS SHALL BE REQUIRED AT EVERY 25 FEET OF CURB.
4. ALL RED CURBS SHALL BE STENCILED.

E "NO PARKING FIRE LANE" CURB MARKING
C5.3 NTS



F CONCRETE WHEEL STOP DETAIL
C5.3 NTS

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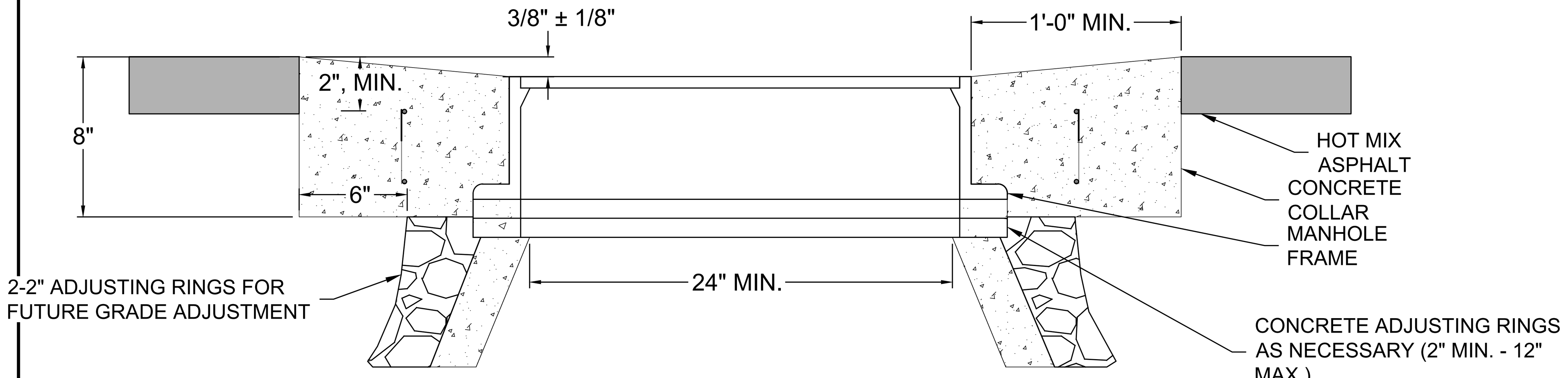
REV.	DESCRIPTION	DATE

PPA#25-1374

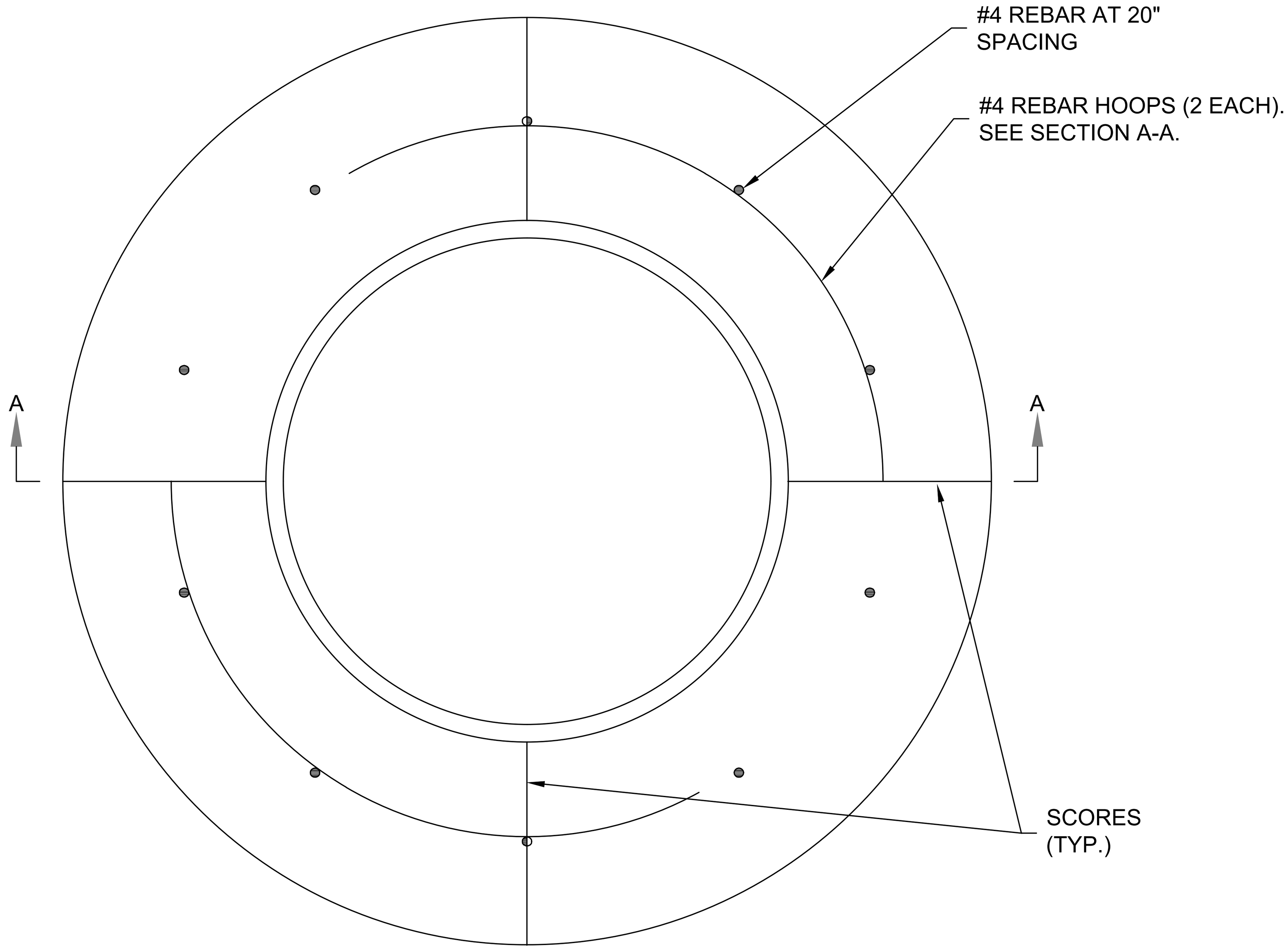
DETAILS 3

SHEET
C5.3

DATE
04-30-2026

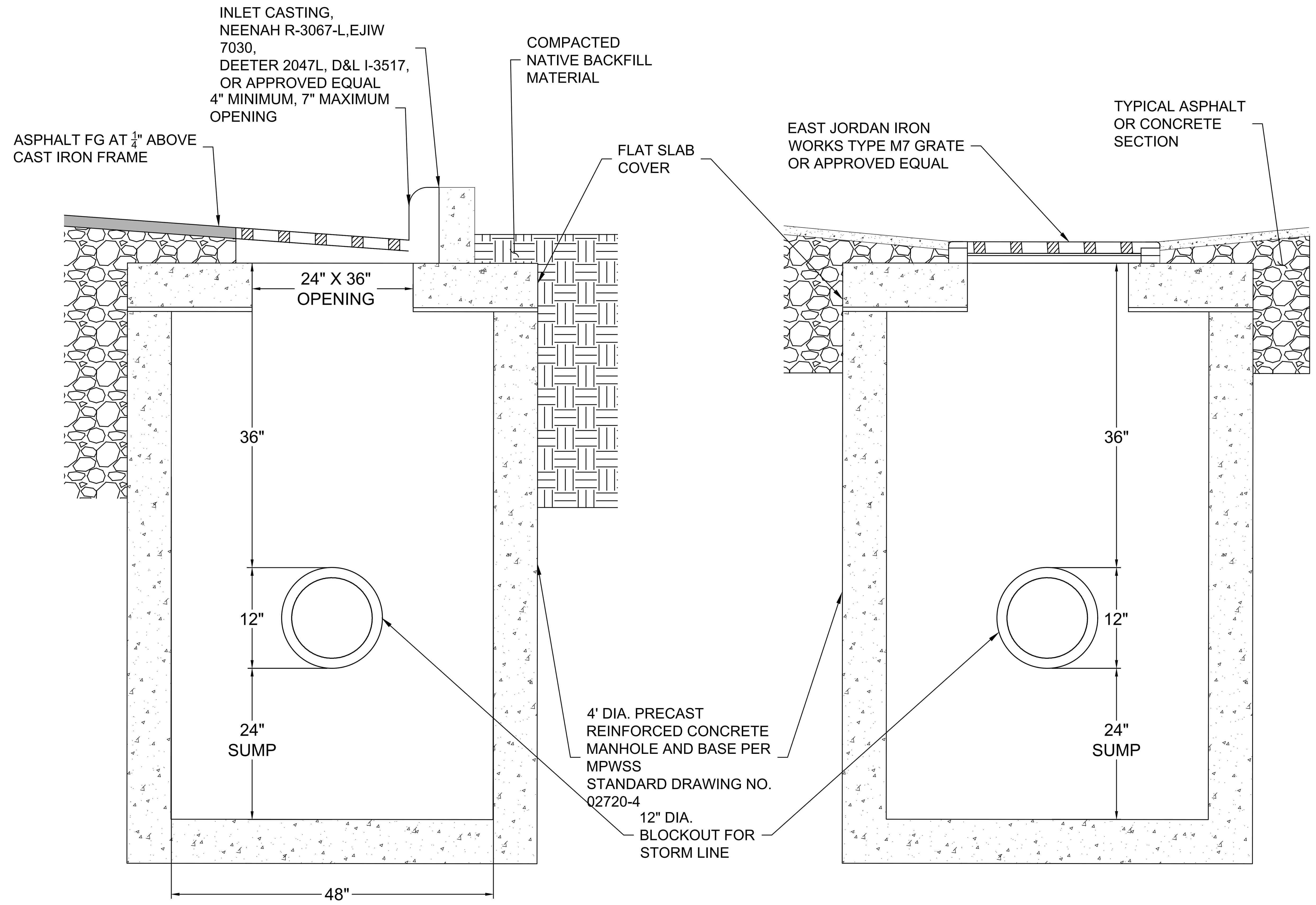


SECTION A-A



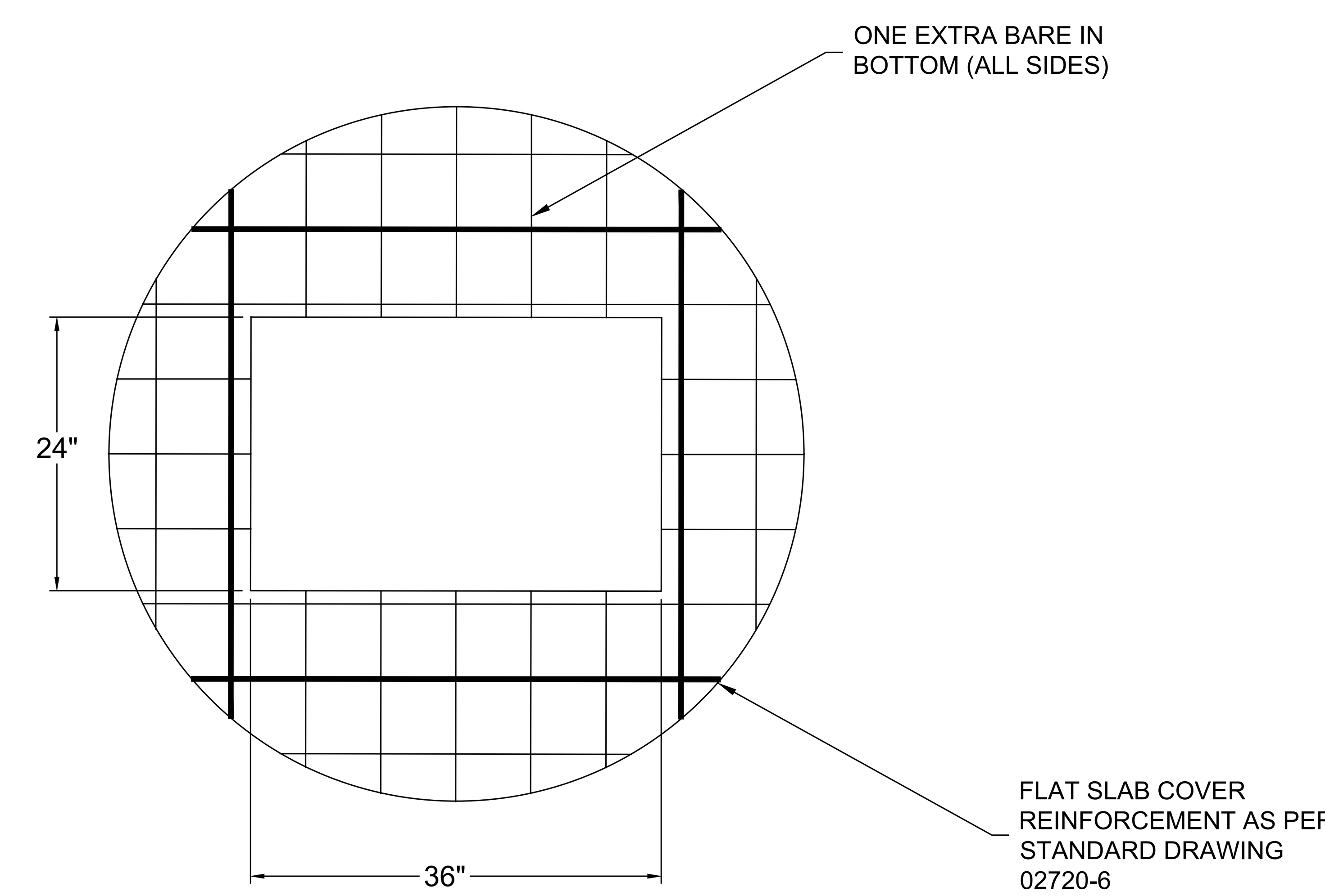
PLAN

A
C5.4
MANHOLE ADJUSTMENT DETAIL
NTS



TYPE A

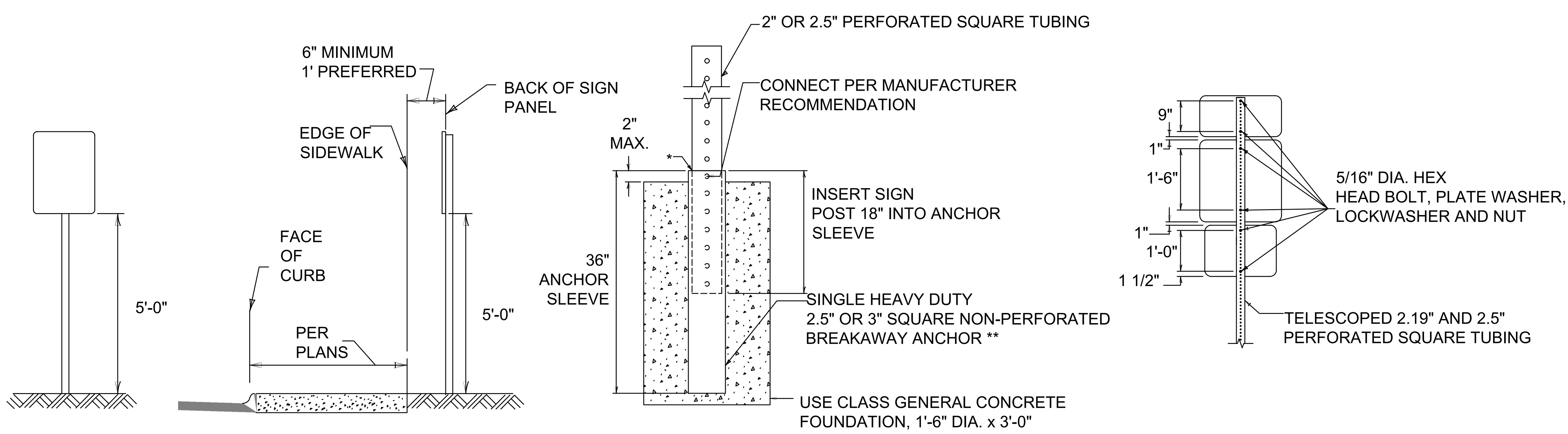
TYPE B



C
C5.4
COMBINATION MANHOLE AND CURB INLET DETAILS
NTS

NOTES:

1. MAINTAIN ADEQUATE COVER OVER STORM DRAINAGE PIPE PER MANUFACTURER RECOMMENDATIONS.
2. BASE AND WALLS MAY BE MONOLITHIC.
3. STRUCTURE SHALL BE DESIGNED IN ACCORDANCE WITH ASTM 857.



B
C5.4
SIGN INSTALLATION DETAIL
NTS

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PPA#25-1374

DETAILS 4

SHEET
C5.4

DATE
04-30-2026

PROJECT INFORMATION

Moose & FWP Parking Lots . Electrical & Lighting Plans

Montana State University - Bozeman, MT

Construction Documents

Date Issued | 4.27.2026

Project Engineer | Andy Moore

Issue

PROJECT 3D VIEW

SHEET INDEX & REVISION HISTORY

ABBREVIATIONS

A, AMP	Ampere	LV	Low Voltage
AIC	Amps Interrupting Capacity	LVR	Low Voltage Relay
AC	Alternating Current	MCB	Main Circuit Breaker
AFCI	Arc-Fault Circuit Interrupter	MDP	Main Distribution Panel
AFF	Above Finished Floor	MFGR	Manufacturer
AFG	Above Finished Grade	MIN	Minimum
ATS	Automatic Transfer Switch	MLO	Main Lug Only
AV	Audio Visual	MSB	Main Switchboard
AWG	American Wire Gauge	MV	Medium Voltage
BAS	Building Automation System	N	Neutral
BTU	British Thermal Units	(N)	New
C, CDT	Conduit	NA, N/A	Not Applicable
CB	Circuit Breaker	NEMA	National Electrical Manufacturer Association
CKT	Circuit		
CL	Centerline	N.C.	Normally Closed
CLG	Ceiling	N.O.	Normally Open
CO	Carbon Monoxide	NTS	Not to Scale
C.O.	Conduit Only	OCPD	Overcurrent Protective Device
CT	Current Transformer	P	Poles
CU	Copper	PB	Pullbox
DDC	Digital Data Control	PH	Phase
DWG	Drawing	PNL	Panelboard
(E)	Existing	POE	Power Over Ethernet
E.C.	Electrical Contractor	PWR	Power
ELEC	Electric / Electrical	RECPT	Receptacle
EM	Emergency	RS	Rigid Steel
EMT	Electrical Metallic Tubing	SD	Smoke Detector
EQ	Equal	SHT	Sheet
FA	Fire Alarm	SOH	Standard Outlet Height
FACP	Fire Alarm Control Panel	SP	Spare
FBO	Furnished by Others	SPEC	Specification
FLA	Full Load Amps	SPD	Surge Protective Device
FSD	Fire Smoke Damper	SS	Surge Supression
G, GND	Ground	SW	Switch
G.C.	General Contractor	SWBD	Switchboard
GEN	Generator	SWGR	Switchgear
GFCI	Ground-Fault Circuit Interrupter	TEMP	Temporary
HP	Horse Power	TVSS	Transient Voltage Surge Suppressor
IBEC	Installed by Electrical Contractor	TYP	Typical
IG	Isolated Ground	UG	Underground
J, JB	Junction Box	UON	Unless Otherwise Noted
KV	Kilovolt	UPS	Uninterruptible Power Supply
KVA	Kilovolt Ampere	V	Voltage
KW	Kilowatt	VA	Volt Amperes
KWH	Kilowatt Hour	W	Watt
LCP	Lighting Control Panel	WD	Warm Dim or Water Detector
LTG	Lighting	WP	Weatherproof
		XFMR	Transformer

GENERAL NOTES

1. All work shall be installed in accordance with the latest National Electrical Code (NEC) and all local codes having jurisdiction. General work practices for construction shall be in accordance with NECA 1 standard for good workmanship in electrical construction (ANSI).
2. All materials provided by the contractor shall be new and free of defects, listed / labeled for the intended purpose by Underwriters (UL) or other organization that is acceptable to the AHJ.
3. The contractor is responsible for providing all equipment required to complete the project. Any bill of materials referenced in this plan set is for reference only to illustrate design intent.
4. The contractor is responsible for laying out all work to conform to NEC clearances, architectural, structural, mechanical, and site conditions, to avoid obstructions and to allow the proper installation of each item. Coordinate with drawings of other trades to fit the actual space conditions.
5. Upon the completion of the work, the entire electrical system shall be tested and shall be shown to be in proper working condition in accordance with the intent of the specifications and drawings. It shall be the responsibility of the contractor to have all systems ready for operation and inspection by AHJ.
6. Electrical contractor to verify actual installed equipment electrical name plate data before energizing the circuit. Confirm electrical design values and actual equipment being installed in compliance with electrical code and manufacturer installation requirements.
7. Conduit runs are diagrammatic. Final location and routing shall be established by the contractor based on the installation conditions and shall be verified in the field. All conduit types and installation requirements shall be in accordance with the specifications. Where conductor and cable routing are not shown on the plans, contractor shall determine routing and lengths required.
8. Provide conduit expansion fittings with bonding jumpers to allow for thermal expansion and contraction where necessary, per NEC 300.7(B).
9. Provide support for conductors in vertical conduits per NEC 300.19. Support conduit using steel pipe straps, lay-in adjustable hangers, clevis hangers, or split hangers. Hanger spacing shall be installed per NEC requirements for the type of conduit being installed.
10. Provide pull or junction boxes where required to facilitate the installation of conductors. Bends in conduit between pull boxes shall not exceed a total of 360-degrees.
11. Provide branch circuit wiring to all items requiring electrical connections. Where branch circuit wiring is not shown, connect items to circuits indicated. Unless indicated otherwise, all branch circuits shall be minimum #12 AWG.
12. Provide independent support for disconnect switches, control stations, boxes, panels, etc. where no walls or other structural surface exists.
13. Provide disconnect switches for HVAC equipment within eyesight of the equipment.
14. Contractor shall provide signage to all electrical boxes, junction boxes, disconnects, conduit runs, subpanels, and main service equipment.
15. Grounding system: Permanently and effectively ground all metallic conduit, supports, cabinets, panelboards, and system neutral conductors. Maintain continuity of equipment ground throughout the system. Ground clamps shall be approved type, specifically designed for grounding. Where grounding conductor is enclosed in conduit, ground clamp shall be of a type which grounds both conductor and conduit. All circuits in flexible metal or plastic conduit shall include a ground wire sized in accordance with NEC.
16. Conductors: Copper with color coding, #10 AWG and smaller to be solid or stranded, #8 AWG and larger to be stranded. Minimum #12 AWG unless otherwise indicated. Aluminum conductors permitted for feeders 100A and larger. Conductors must be installed in accordance with NEC and cannot be supported from ceiling support wires. All power conductors in conduit shall be THWN-2, XHHN-2, RHW-2, PVWIRE, or XLPE.
17. All smoke detectors to be listed and installed in accordance with the latest edition of NFPA 72. Smoke detectors to be wired together and receive primary power from the buildings wiring.
18. Submittals shall be provided by the installer for Blacksheep review and approved prior to ordering.
19. The EC may submit substitution requests for prior approval no less than 10 days prior to bid date. Blacksheep separates prior approval packages for luminaires & controls. The EC shall break out separate line items for each to prevent 'lockout' of pricing respective to this project.
20. It is the responsibility of the EC and GC to schedule the following milestones with the lighting designer, no less than 1 week prior to the requested date.
    A. Rough-In Inspection - prior to finish work.
    B. Programming to be scheduled first with the factory-authorized representative and then coordinated with Blacksheep for oversight and design intent.

SYMBOL LEGEND

Symbols listed below are for reference and for the use in understanding the design intent. Not all symbols listed below are necessarily used elsewhere in the construction documents. Cabling information is for reference only; All devices need to be assessed on an individual basis. Halftone symbols represent scope that is not included in the construction documents.

Electrical

- NEMA 5-15R / 5-20R, Mounted Vertically, Non-Essential Power
- NEMA 5-15R / 5-20R, Mounted Horizontally, Non-Essential Power
- NEMA 5-15R Quadruplex
- Unfilled = Protected by GFCI Breaker
  Filled = GFCI Receptacle
- Unfilled = Weatherproof Receptacle
  Filled = Weatherproof Receptacle, In-Use
- Red = Essential Power
  Blue = Optional Standby Power
- Half-Switched Receptacle
  '+1.5' Indicates Height AFF
- NEMA 6-X0R, 250V, 2-Pole; Number Indicates Amperage (i.e., 2 = 20A)
- NEMA 14-X0R, 250/125V, 2-Pole w/ Neutral; Number Indicates Amperage
- NEMA 15-X0R, 250V, 3-Pole; Number Indicates Amperage
- NEMA L6-X0R, 250V, 2-Pole; Number Indicates Amperage
- NEMA L14-X0R, 250/125V, 2-Pole w/ Neutral; Number Indicates Amperage
- NEMA L15-X0R, 250V, 3-Pole; Number Indicates Amperage
- Electrical Provision or Equipment Connection Provision
- FLR — Electrical Floor Receptacle, Flush Mounted
- J — Junction Box, Mounted Above Accessible Ceiling
- J — Junction Box, Recessed Wall Mounted
- J — Junction Box, Flush Floor Mounted
- Wiremold Power Outlet Strip
- Non-Fused Disconnect Switch, Surface Mounted
- Fused Disconnect Switch, Surface Mounted
- Panelboard, Flush Mounted
- Panelboard, Surface Mounted
- EPO — Push Button | EPO = Emergency Power Off
- MMS — Manual Motor Start / Switch
- Inverter

Fire & Life Safety

- SD — Smoke Detector
- SC — Combination Smoke/CO Detector
- HD — Heat Detector
- CO — Carbon Monoxide Detector
- GD — Gas Detector
- Horn Strobe
- Strobe
- Sprinkler Flow Switch
- Tamper Switch

Lighting Luminaires

- Bollard
- Ceiling Mounted
- Wall Mounted
- Uplight | In-Grade
- Recessed Downlight | Round or Square
- Pendant | Round or Square
- Art Light | Wall Mounted
- Linear LED
- Linear LED Vertical | Recessed or Surface
- Linear | Recessed
- Linear | Surface
- Linear | Suspended
- Step Light
- Track & Track Heads
- Monopoint | Ceiling or Wall Mounted
- Pole Mounted, Below | Round or Square
- Pole Mounted, Side | Round or Square
- Exit Sign | Ceiling Mounted
  Shade Denotes Face Read
  Arrow Denotes Directional Sign
- Exit Sign | Wall Mounted
  Shade Denotes Face Read
  Arrow Denotes Directional Sign
- Exit Sign w/ Emergency Lighting | Wall Mounted
  Shade Denotes Face Read
  Arrow Denotes Directional Sign
- Emergency Lighting Unit
- Half Switch Receptacle | For System Control Only
- Floor Half Switch Receptacle | For System Control Only
- EF — Exhaust Fan | For System Control Only
- EH — Electric Patio Heater | For System Control Only
- FP — Fireplace | 120V System Control

Lighting Control | Shades | Environmental

- PN — Lighting Control Panel
- Lighting Control Dimming Panel
- LRP — Lighting Repeater
- Lighting/Shade Keypad
- OS — Occupancy Sensor
- FP — Fireplace Control
- D — Dimmer
- Remote Dimmer - 3-Way
- S — Switch
- Remote Switch - 3-Way
- D S — Non-Controlled Dimmer/Switch (Provided by the EC)
- PP — Power Pack
- LD — Low Voltage Driver
- PN — Shade Panel
- MS — Single Roller Motorized Shade
- DS — Dual Roller Motorized Shade
- D — Motorized Drape
- SG — Electronic Smart Glass

Communications | Audio | Video

- PN — Cabling Enclosure
- Data Outlet
- AP — Wireless Access Point
- DM — Demarcation - Phone / Data Service
- ST — Satellite Dish Location
- TP — Touch Panel
- CRF — Control RF Gateway
- CI — Control System Integration Wiring
- TV — Television
- PJ — Projector
- AUX — Aux Input Location
- Backbox
- SP SP — Speaker
- SW SW — Subwoofer
- SB — Soundbar - LR / LCR / Center
- Doorbell
- Remote Control
- Equipment Rack

Security & Surveillance

- PN — Security Panel
- SKP — Security Keypad
- CC — Cellular Communicator
- SRP — RF Receiver
- SA — RF Repeater
- Door / Window Contact Sensor
- Motion Detector
- Glass Break Sensor
- Interior Siren
- Sewage Ejector Interface
- Water / Flood Sensor
- Low Temperature Sensor
- Wireless Flood / Low Temp Sensor
- Water Shutoff Valve
- CM — Surveillance Camera

Access Control

- PN — Access Control Panel
- Access Control Interface
- Access Control Lock

General Drawing Symbols

- XX.XX — Callout View Tag
- ? — Keynote Tag
- R1 LCP1-1 — Lighting Tag w/ Circuit ID
- PP1-12 WH-1 — Mechanical Equipment Tag w/ Circuit ID
- TV TV1 101.01 — Technology Tag w/ Cable ID
- X2.XX / X2.XX / X2.XX / X2.XX — Elevation Tag
- Panel 'PP1X' — Electrical Equipment Tag
- X4.XX — Section Head & Tail

BLACK SHEEP

Structural | Mechanical | Electrical | Plumbing
Lighting | Technology

602 W Hemlock | Bozeman, MT 59715
Blacksheep.engineering | 406.312.5714

MONTANA
ANDREW S. MOORE
No. 34049PE
LICENSED PROFESSIONAL ENGINEER

Moose & FWP Parking Lots

Montana State University - Bozeman, MT

Construction Documents

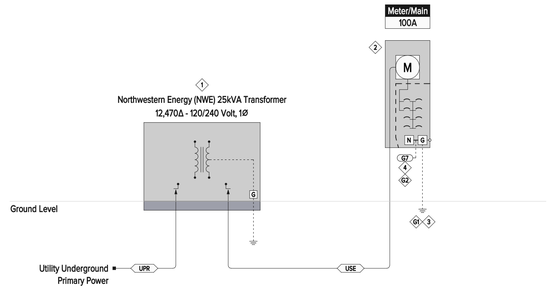
Issue Date: 4.27.2026

REVISIONS

	DATE	DESCRIPTION

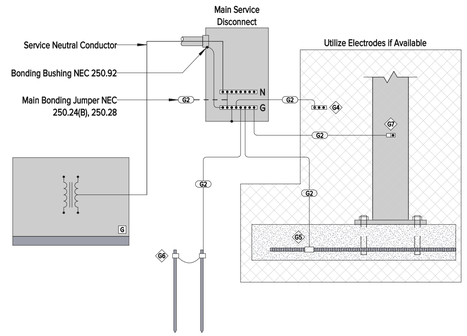
ELECTRICAL & LIGHTING INDEX

E0.0



Feeder Schedule

Feeder ID	Panel Name	Available Fault Current	AIC Rating	Voltage	Phase	Neutral	Feeder Ground	Length	Conduit Size	Transformer KVA	Transformer Z%
	Service XFMR	5,952		12,470V						25	1.75
USE	P1	5,214	10,000 A	240V	#1	#1	#6	32'	1-1/4"C		



Provide GEC Size as Noted	Service Conductor Sizes - NEC Table 250.66	GEC Description
G1 #8 CU	#2 or smaller	Ground Rods, IBT, UFER, Service
G2 #6 CU	#1 or 1/0	
G3 #4 CU	2/0 or 3/0	
G4 #2 CU	4/0 through 350KCMIL	
G5 1/0 CU	400KCMIL through 600KCMIL	
G6 2/0 CU	700KCMIL through 1100KCMIL	
G7 3/0 CU	Over 1100KCMIL	

One-Line Diagram Notes

1. Northwestern Energy (NWE) will provide, install, and maintain transformers and service conductors. E.C. to provide, install, and maintain all service equipment and will provide access for the installation and maintenance of NWE's facilities.
2. E.C. shall furnish and install the service entrance metering equipment. NWE will connect Schedule 40 PVC conduit to E.C.-provided meter base.
3. E.C. shall furnish and install a minimum of two 8-foot driven ground rods 6-feet apart. E.C. shall connect all available grounds to form the grounding electrode system. Reference the grounding and bonding sheet notes and diagram below.
4. E.C. shall install the neutral-ground bond at the main service disconnect.

Grounding & Bonding Notes

G1 All grounding electrodes that are present at building or structure shall be bonded together to create grounding electrode system. These include metal underground water pipes, structural steel frame of building, concrete encased electrodes, ground rings, plate electrodes, and ground rods. If none of these grounding electrodes exist, one or more of the following grounding electrodes shall be installed and used [NEC 250.50].

A. Ground Ring
B. Rod and Pipe Electrodes
C. Plate Electrodes
D. Local metal underground systems or structures that are not bonded to a metal water pipe. Do not use metal underground gas piping systems as a grounding electrode.

G2 Provide grounding bar at service entrance to distribute grounding connection(s) to applicable electrodes as shown.

G3 Connections to grounding electrodes shall be made by exothermic welding, listed lugs, connectors, clamps or other listed means. [NEC 250.70]

G4 Intersystem bonding termination (IBT) shall be provided external to enclosures at the service equipment or metering equipment enclosure and at the disconnecting means for additional buildings per NEC Art. 250.94.

G5 **Concrete-Encased Electrodes.** Grounding electrode system to include a concrete-encased electrode per NEC Art. 250.52(A)(3) and 250.66(B).

- Minimum 20 feet (6 m) in length.
- Bare or zinc galvanized or other electrically conductive coated rebar not less than 1/2" in diameter.
- Encased in at least 2" of concrete that is in direct contact with the earth.
- Located horizontally within conrete foundation or footing or within vertical foundations or structural components.
- Insulation, vapor barriers, films or similar items negate "direct contact" with the earth.
- Grounding electrode conductor shall be sized per NEC table 250.66. If the grounding electrode conductor doesn't extend on to other types of electrodes that require a larger size conductor, the grounding electrode conductor shall not be required to be larger than #4 AWG copper wire.

If multiple concrete-encased electrodes are present at a building or structure, it shall be permissible to bond only one into the grounding electrode system.

G6 **Rod and Pipe Electrodes.** Grounding electrode system to include supplemental rod-type electrode per NEC Art. 250.52(A)(5) and 250.66(A).

- Minimum 8 feet in length and at least 5/8 inches in diameter.
- Stainless steel, copper-clad, or zinc-coated steel
- Grounding electrode conductor sized per NEC table 250.66. If the grounding electrode conductor doesn't extend on to other types of electrodes that require a larger size conductor, the grounding electrode conductor shall not be required to be larger than #6 AWG copper wire or #4 AWG aluminum wire.

G7 **Structural Steel.** Grounding electrode conductor to structrual steel per NEC Art. 250.52(A)(2) and 250.68(C)(2). Bonding jumper to metal support structure if the grounding electrode conductor is not installed.

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Moose & FWP Parking Lots

Montana State University - Bozeman, MT

Construction Documents

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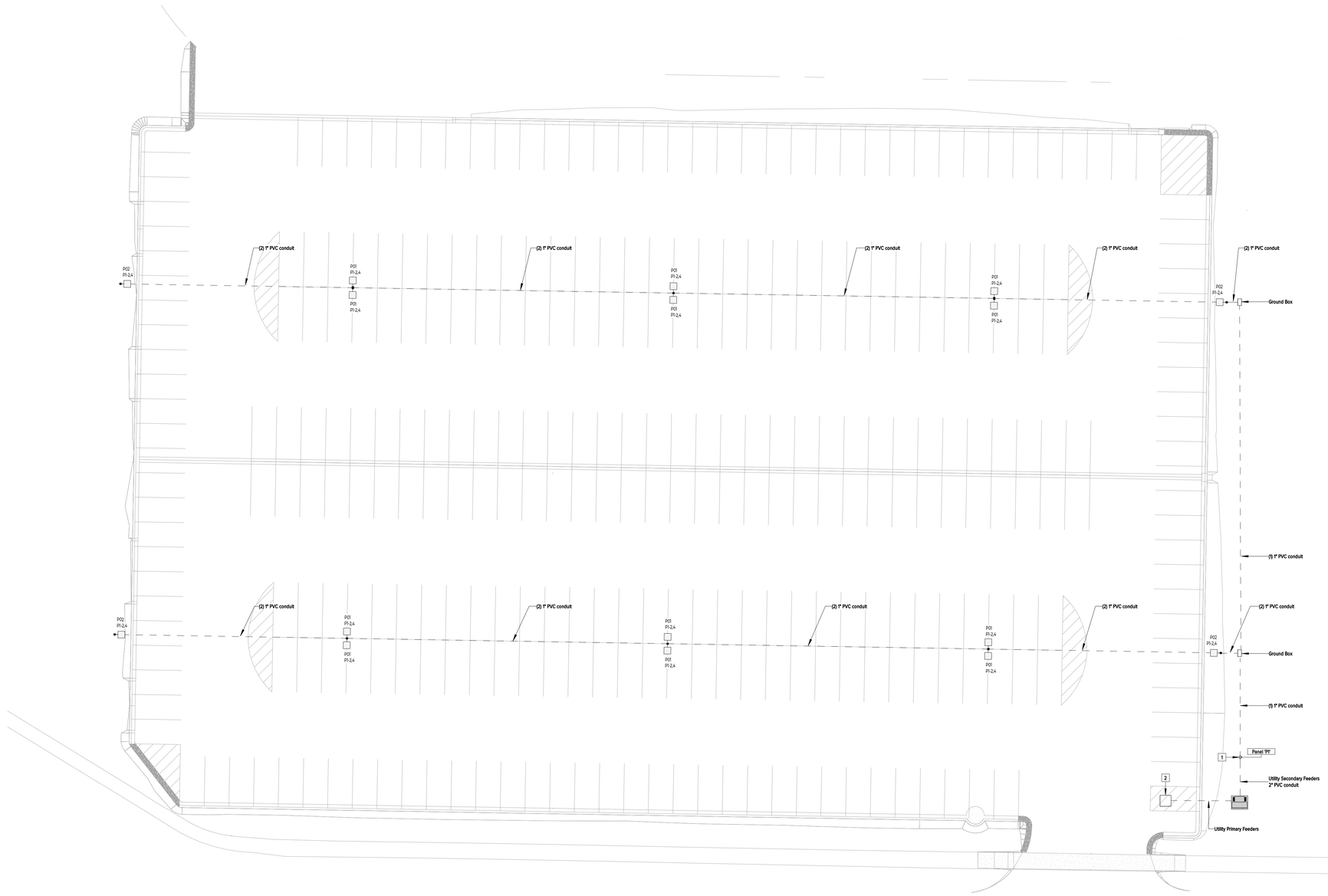
	DATE	DESCRIPTION

ELECTRICAL ONE-LINE DIAGRAMS

E6.1



1 **Site Lighting Plan**
1" = 20'-0"

Reference Keynotes

1. Post mounted electrical service to conform to Northwestern Energy's Electric Service Requirements.
2. Drive over rated ground box by Northwestern Energy.

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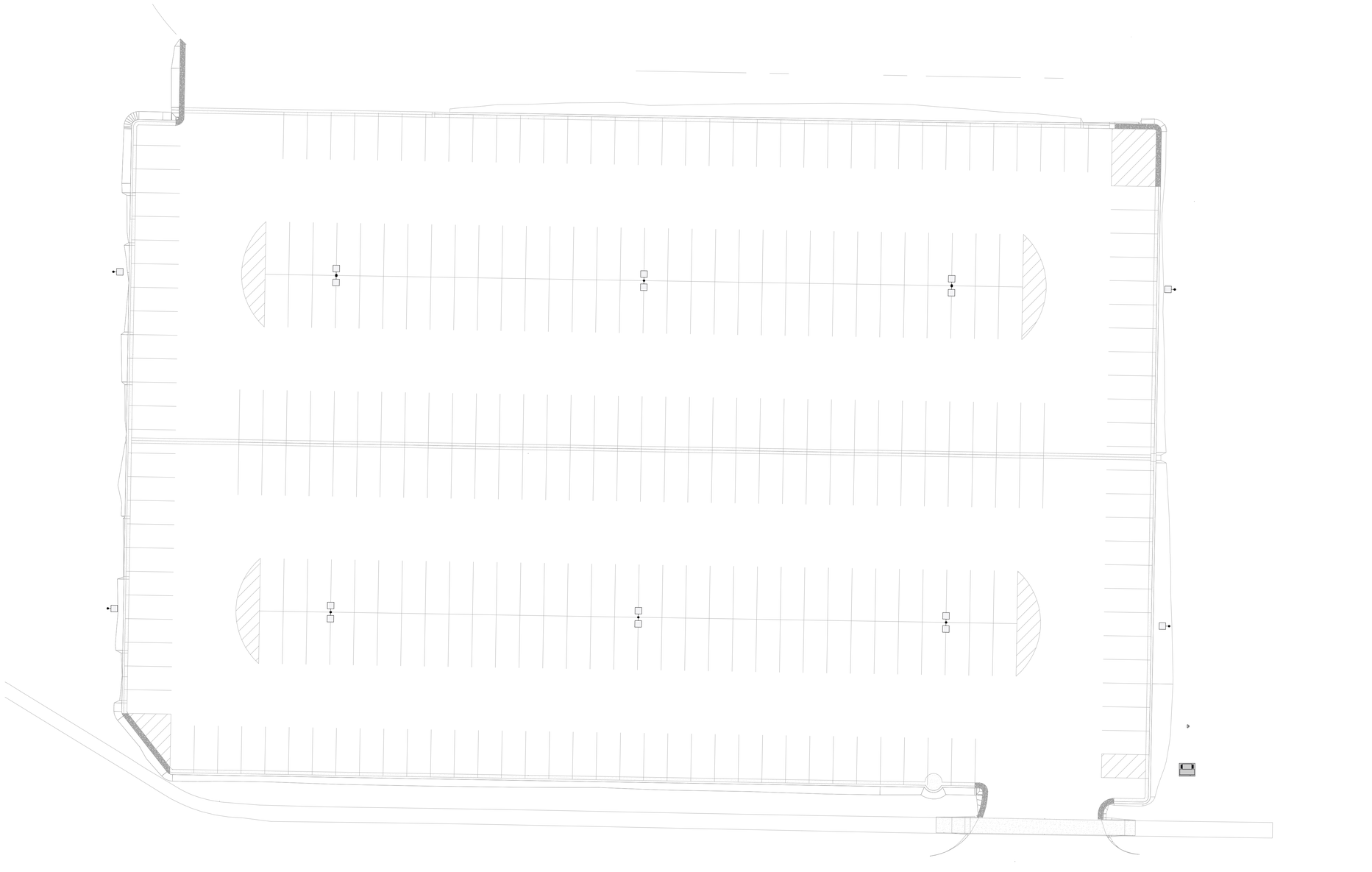
LIGHTING SITE PLAN

EL1.01

Illuminance Summary				
	Illuminance			Illuminance Ratio
Maximum	Average	Minimum	Max : Ave	Max : Min
3.33 fc	1.26 fc	0.27 fc	2.634953	12.43057

Reference Keynotes



1 **Site Photometric Plan**
1" = 20'-0"

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SITE PHOTOMETRIC PLAN

EL1.02

Panel 'P1'

PANEL	P1	VOLTAGE	120/240 Single	MAIN BUS RATING	100 A	MAIN BUS FEED LOCATION	
LOCATION	Moose Lot Service	PHASE	1Ø	MAINS TYPE	MCB	MAIN BUS FEED-THROUGH LOAD	
MOUNTING	Pedestal	WIRE	3	MAIN CIRCUIT BREAKER	100 A	SUB-FEED #1 BREAKER RATING	
FED FROM	Service XFMR	ENCLOSURE TYPE	NEMA 3R	SHORT CIRCUIT AIC RATING	10,000 A	SUB-FEED #2 BREAKER RATING	

Details:

Circuit Breaker Protection Types |
- A = Arc-Fault Protection
- G = Ground-Fault Personnel
- D = Dual Arc-Fault and Ground-Fault Protection
- E = Ground-Fault Equipment
- L = Breaker Lock-Off Device
- S = Furnish with Standard Breaker
- ST = Shunt Trip Device

Notes:

Basis of design is an all-in-one post mounted panel by Midwest Electric. Part number: R101CB2010

CKT	CIRCUIT DESCRIPTION	WIRE	TYPE	TRIP	POLES	A		B		POLES	TRIP	TYPE	WIRE	CIRCUIT DESCRIPTION	CKT
1	Main Breaker	--	--	100 A	2	0 VA	544 VA			2	20 A	S	1°C, 2#8, #10G	Lighting | Moose Lot	2
3	--	--	--	--	--			0 VA	544 VA	--	--	--	--	--	4
5	Receptacle | Service Pedestal	1°C, 1#12, #12N, #12G	S	20 A	1	180 VA	--			1	--	--	--	Provision	6
7	Provision	--	--	--	1			--	--	1	--	--	--	Provision	8
					Total Apparent Power Phase Loads:	**724 VA**		**544 VA**							
					Total Current Phase Loads:	**6 A**		**5 A**							

CONNECTED LOADS:	
Phase A:	724 VA
Phase B:	544 VA
Phase C:	0 VA
Total:	**1268 VA**

LOAD CLASSIFICATION	CONNECTED LOADS (VA)	DEMAND FACTOR	ESTIMATED DEMAND (VA)
Commercial - Receptacles	180 VA	100.00%	180 VA
Lighting	1088 VA	100.00%	1088 VA

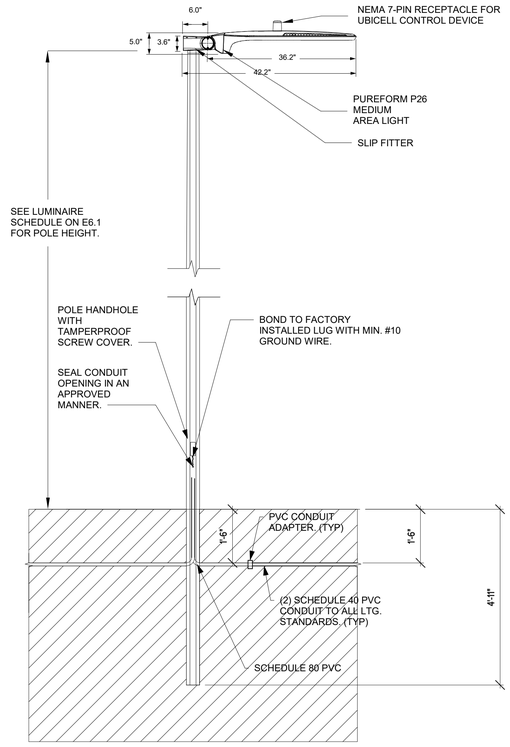
PANEL TOTALS	
Total Connected Load:	1268 VA
Total Estimated Demand:	1268 VA
Total Connected Current:	5 A
Total Estimated Demand Current:	5 A

Luminaires

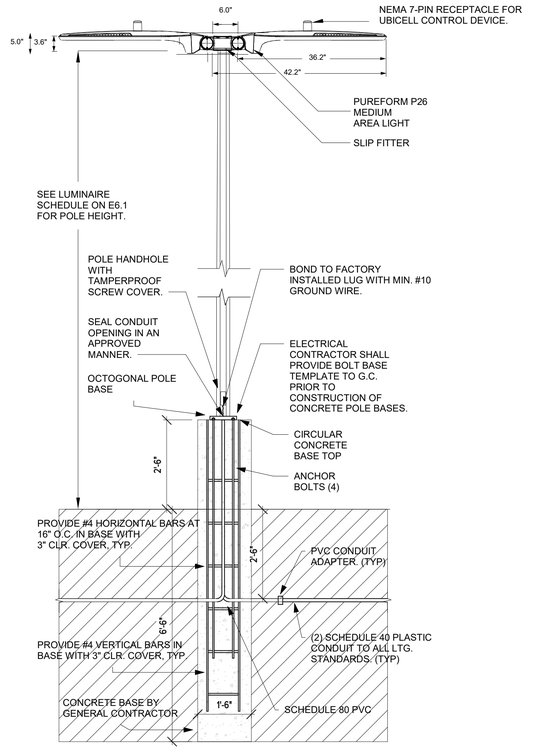
Type	Description	Manufacturer	Model	CCT	CRI	Dimming	Load	Lumens	Notes
P01	PureForm Pole Head - Type 3 Distribution	Gardco	P26-A01-830-T3M-SF-UNV-010V-TRL7-BK	3000 K	80	0-10 V	68 VA	11861 lm	1, 3, 4, 5, 7
P02	PureForm Pole Head - Type 2 Distribution	Gardco	P26-A01-830-T2M-SF-UNV-010V-TRL7-BK	3000 K	80	0-10 V	68 VA	12076 lm	2, 4, 5, 6

Notes

1. Pole to have a concrete base; see detail.
2. Provide luminaire with Ameron MB008.5 and a 2-3/8" x 4" tenon.
3. Provide luminaire with Ameron MB008 and a 2-3/8" x 4" tenon.
4. Provide Ubicquia UbiCell for lighting control; UBC-40-0-01-NA-01-2-TR.
5. EC to provide and coordinate full Ubicquia control system programming, training, and software setup at a location as desired by MSU.
6. Provide with P26-PTF2-1-90-BK top fitter.
7. Provide with P26-PTF2-2-180-BK top fitter.



1 SINGLE HEAD DETAIL
NTS



2 TWIN HEAD DETAIL
NTS

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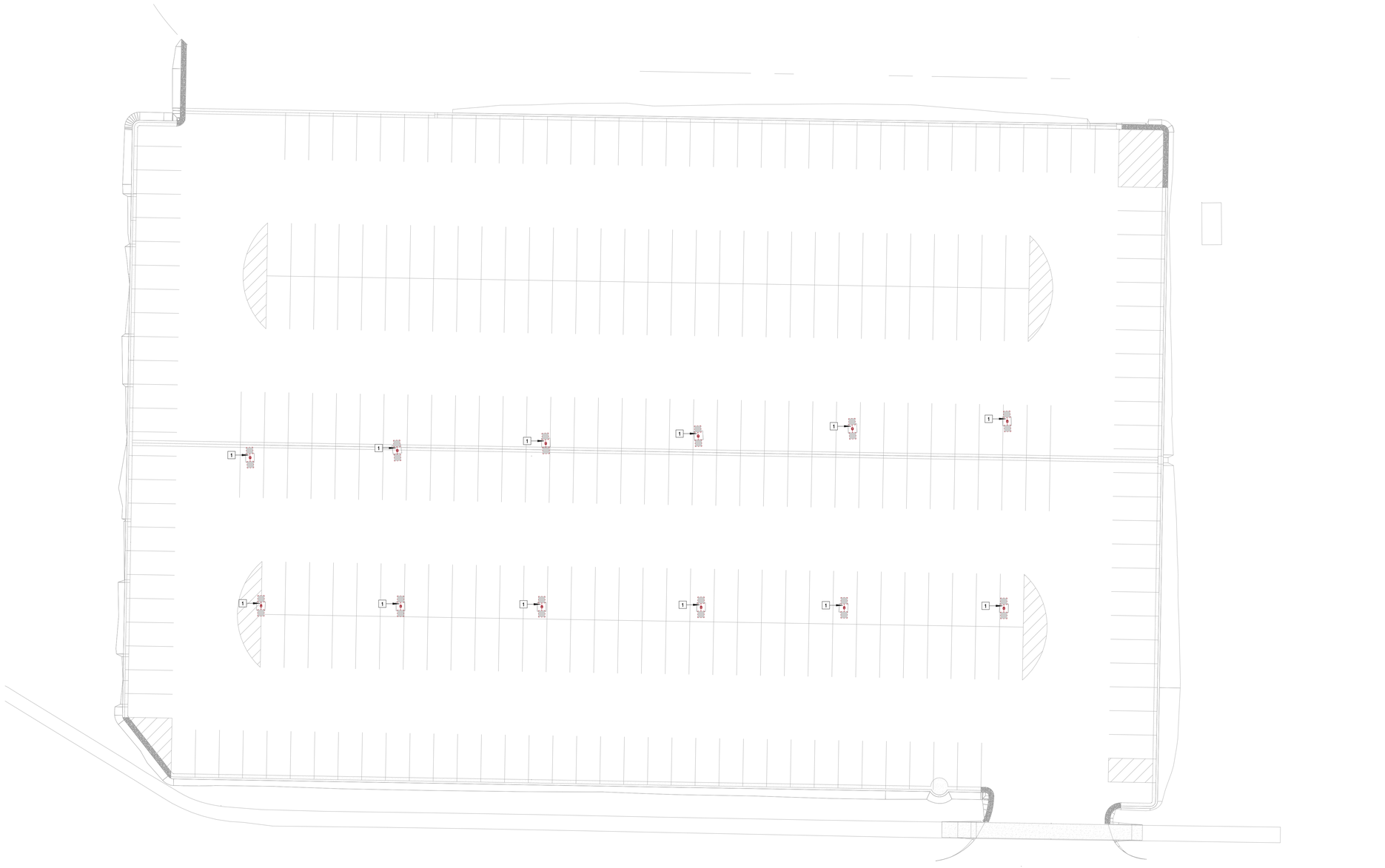
LUMINAIRES & LIGHTING EQUIPMENT SCHEDULES

EL6.1



1 **Site Lighting Demo Plan**
1" = 20'-0"

Reference Keynotes

1. Remove existing solar powered luminaires and return to University Facilities Management. Coordinate delivery with University Facilities Management. Diconnect batteries prior to relocation and follow Greenshine Solar preventative maintenance procedures to avoid damage.

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LIGHTING SITE DEMO PLAN

ELD1.01