P46 Drainage and Pedway Design Project

Northern Arizona Univesity

Pine Knoll Drive From Huffer Lane to P45A

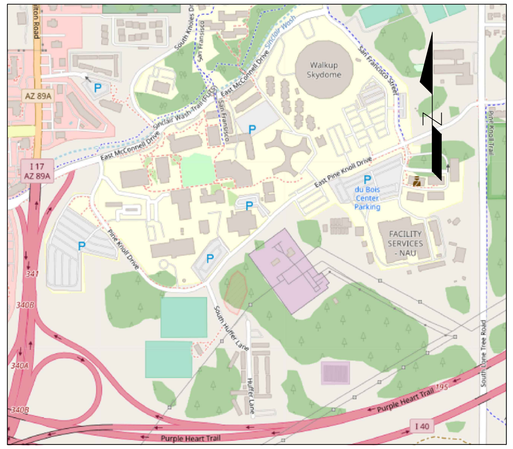
PROJECT DESCRIPTION

THE PROJECT IS LOCATED ALONG EAST PINE KNOLL DRIVE BETWEEN HUFFER LANE AND THE P45 ENTRANCE. THE PURPOSE OF THE PROJECT IS TO IMPROVE DRAINAGE ACROSS THE P46 PARKING LOT AND INCREASE PEDESTRIAN ACCESSIBILITY BY ADDING ADA AND UNIVERSAL DESIGN COMPLIANT PEDWAYS ALONG THE NORTH SIDE OF PINE KNOLL DRIVE.

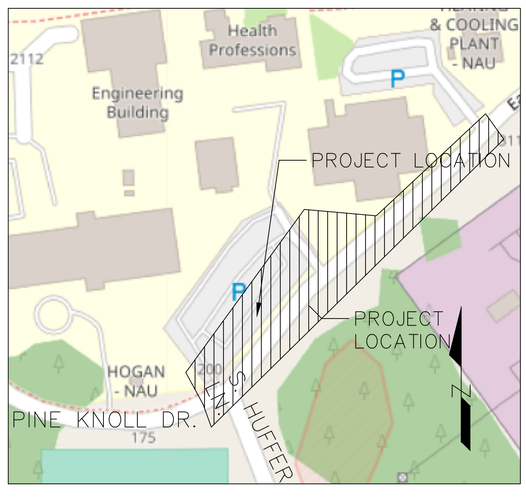
PROJECT STANDARDS

- CITY OF FLAGSTAFF ENGINEERING DESIGN GUIDELIES AND STANDARDS (2016)
- CITY OF FLAGSTAFF STORMWATER MANAGEMENT MANUAL (2009)
- COCONINO COUNTY ENGINEERING DESIGN AND CONSTRUCTION MANUAL (2018)
- NAU FLAGSTAFF CAMPUS MASTER PLAN (2010)
- NAU LANDSCAPE MASTER PLAN (2015)
- MAG UNIFORM STANDARD SPECIFICATIONS AND DETAILS (2020)

VICINITY MAP



SITE MAP



CLIENT INFORMATION

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DESIGN TEAM

MAX REGAN
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QUANTITIES		
DESCRIPTION	QUANTITY	UNITS
SIDEWALK RAMP, MAG 236-1	3	EA
AGGREGATE BASE	98	CY
24" CMP	418	LF
SAW CUTTING	606	LF
CURB AND GUTTER, MAG 220-1 TYPE A	375	LF
6' SIDEWALK, MAG 230	810	LF

LEGEND	
LIGHT POLE	
CMP	
STORM DRAIN	
SIGN	
SAW CUT	
EXISTING STRIPING	
NEW STRIPING	
24" CMP	

SHEET INDEX		
PAGE	TITLE	DESCRIPTION
1	COVER	PROJECT INFORMATION
2	NOTES	GENERAL PROJECT NOTES
3	DETAILS	STANDARD DETAILS USED
4	TOPO	RESULTS OF SURVEY
5	DESIGN	DRAINAGE/PEDWAY DESIGN

~SHEET~ 1 OF 5

Northern Arizona University
Department of Civil Engineering, Construction Management and Environmental Engineering

REVISIONS		
NO.	DATE	COMMENTS
1	5/14/20	
2	4/22/20	
3	4/28/20	

DRAWN BY: MAX REGAN
CHECKED BY: MAX REGAN
DATE: 5/8/20
SCALE: NA

P46 DRAINAGE AND PEDWAY

COVER

PRODUCED BY AN AUTODESK STUDENT VERSION

COF Municipal Codes

SECTION 13–03–006–0001 Survey Criteria
All as–built survey data shall tie into the same horizontal and vertical control as that used for the approved construction plans. All stationing shall be relative to that of the plans. At least two (2) horizontal cross–ties shall be provided for each water valve box. The cross–tie is defined as an unobstructed horizontal measurement to the nearest one–tenth (0.1) feet from an object that is at least thirty (30) inches high and vertical (plumb) in nature. Examples are operating nuts on fire hydrants, utility poles, prominent building corners and fence corners which are set in concrete. (Ord. 2017–22, Rep&ReEn, 07/05/2017)

SECTION 13–05–001–0003 Storm Drainage Report
A. A drainage report, prepared in accordance with the requirements of the Stormwater Design Regulations, is required and must be approved prior to approval of the construction plans.
1. If, in preparation of the report, the engineer finds that substantial changes from the approved preliminary plat are required to produce an economical development, he shall prepare a revised preliminary plat.
a. Forcing engineering solutions to conform to an approved preliminary plat is not acceptable.
2. The report should be prepared in conjunction with the approved preliminary plat and/or construction drawings until all design problems are worked out.
B. If low impact development (LID) is proposed in the right–of–way, the following shall be addressed to the satisfaction of the City Engineer and the Public Works Section Head:
1. Measures provided to ensure the preservation of adjacent pavement section, or other associated infrastructure, as the result of infiltration and/or standing water associated with an IMP.
2. A detailed operations and maintenance manual that, at a minimum, shall include a narrative describing the purpose and function of the IMP, required maintenance activities, and needed inspection activities. (Ord. 2017–22, Rep&ReEn, 07/05/2017)

SECTION 13–05–002–0004 Stormwater Impact Analysis
A stormwater impact analysis shall be required for a general plan amendment or a request for a zoning change. When required, the following shall be provided in a report for review and approval.

A. Calculations for pre– and post–development runoff volumes.
B. Downstream impacts as the result of increased volumes shall be assessed as scoped by the City's Stormwater Management Section and may include:
1. Hydrologic calculations to determine discharges at various downstream points pre– and post–development.
2. Corresponding hydraulic calculations to determine any increase in water surface elevations.
3. A geomorphic analysis to determine channel stability and sediment transport concerns as the result of increased flow duration created by increased volumes and clear water runoff created by development.
4. Other hydrologic and hydraulic calculations necessary to determine and resolve impacts.
C. Water surface increases may be allowed; provided, that they are less than one–tenth (1/10) of one (1) foot (0.1 feet) and there are no structures with known or calculated flooding problems or other major concerns. Water surface increases for Lake Continental, aka Big Fill Lake, (impoundment located on the Rio de Flag upstream of Route 66/I–40) are prohibited. (Ord. 2017–22, Rep&ReEn, 07/05/2017)

CITY OF FLAGSTAFF DRAINAGE DESIGN

Design Velocity and Slope
In general, storm drain slopes and velocities should increase in the downstream direction progressively throughout the length of the system. The minimum allowable storm drain slope for any storm drain pipe shall be 0.5 percent or the slope which will produce a velocity of three (3) feet per second for the pipe flowing full, whichever is greater. Slopes less than 0.5% require special approval by the Stormwater Manager.
Desirable minimum velocity is five (5) feet per second, however all storm drains shall be designed such that the minimum self–cleaning velocity will be three (3) feet per second flowing full. This criteria results in a minimum flow velocity of two (2) feet per second at a flow depth equal to twentyfive (25) percent of the pipe diameter.

Alignment
Storm drains shall be straight, with uniform slopes between manholes, whenever possible. Curved
7–3
storm drains may be permitted when long radius curves are necessary to conform to street layout, however, storm drains smaller than four (4) feet in diameter should not be designed with curves.
Long radius bends are available from many suppliers and are preferred as a means of changing direction in storm drains four (4) foot in diameter or larger, unless a manhole is required. The radius of curvature specified should coincide with standard curves available in the type of material utilized.
The minimum radius shall not be less than 100 feet.

Storm Drain Conduit Size
The minimum pipe diameter for public storm drains shall be eighteen (18) inches in diameter. The use of elliptical or arched pipe for storm drains is not recommended and must be approved by the Stormwater Manager prior to use. Storm drain pipe sizes shall increase in the downstream direction.
Decreasing the pipe size in the downstream direction is not permitted even for flow on a steeper slope or pressure profiles.

Separation Requirements
Installation and backfill requirements for public storm drains shall be in accordance with City of Flagstaff Engineering Design & Construction Standards.
Vertical and horizontal separation requirements for storm drain conduit to waterlines shall be the same as for sewer pipes per the City of Flagstaff Engineering Design and Construction Standards & Specifications.

The minimum clearance between storm drains and all other dry underground utilities shall be twelve (12) inches and shall cross at angles greater than forty–five (45) degrees, if possible. If 12 inches of separation cannot be maintained, one of the pipes must be encased in concrete.
Crossings of open channels may require concrete encasement to minimize damage to the pipe if adequate cover (24" minimum) cannot be obtained or scour is anticipated.

NAU Design Guidelines

8.3.1.1. ADA Guidelines
• All work must conform to the 2010 ADA Standards for Accessible Design:
https://www.ada.gov/regs2010/2010ADAStandards/2010ADAStandards_prt.pdf.
• Design Professionals must consider the effects of renovations on the existing space with regard to accessibility, and in particular the path of travel in "an alteration that affects or could affect the usability of or access to an area of a facility that contains a primary function"(ADA Standards 2010). The 2010 ADA Standards for Accessible Design have a disproportionality measure if the alteration to an area exceeds 20% of the cost of the alteration to the primary function area. A worksheet and calculation example developed by NAU is available for assistance on this matter at: http://nau.edu/FacilityServices/DP_Contract/.

8.3.2.5. Ramps
• Where changes in elevation are encountered (including courtyards and open spaces) full consideration shall be given to universally accessible design that addresses elevation change.
• Where grades/space allow, sloped sidewalks (slope 1:20 or flatter) shall be used to overcome changes in elevation.
• Ramps (defined as anything steeper than 1:20 slope) shall have a maximum of 1:16 slope.
8.3.2.1. Curb Ramps (curb cuts)
• Curb ramp slopes shall be 1:12.
• Concrete aprons shall be provided at the bottom of the curb ramps.
• Curb ramps within sidewalks (parallel to the path of travel) shall be provided with a 1:16 slope.
• Owner's standard for detectable warning surfaces is truncated domes in a contrasting color. Pavers with truncated domes are prohibited.
• The depth of detectable warning surface in the direction of travel shall not exceed 24 inches.

NAU LANDSCAPE MASTERPLAN

Concrete Paving Sand Finish
• Concrete to meet NAU Technical Standards
• Sand finish standards
• Standard gray concrete (no color or pigment)
Sand Finish Standards: Surface Retarder
• Product: 'TOP CAST'by Grace Construction Products or Landscape Architect approved equal
• Number Code: Grade 05
• Etch/Aggregate Size to Expose: Light Sandblast Finish
• Coverage: 250/350 Square Feet Per Gallon
• Retardant removal per manufacturer standards, typically within 6–24 hours after application. Timing of removal dependent upon temperature to create desired finish.
• Refer to Pedway Design Standards (Page 219) for additional details

Concrete Edger
• Concrete to meet NAU Technical Standards
• MAG Type 'B'Curb (Detail 222 – 6.0"wide, 12"depth) modified to be flush with finished grade
• Standard gray concrete (no color or pigment)

Concrete Scoring Patterns & Control Joints
• Saw cut and beveled at special gathering areas
• Tooled for sidewalks and pedestrian areas with broom finish
• Scoring and joints must have beveled edge
• Joints must extend to a depth of 1/4 of slab thickness
• Rectangular or square patterns
• Patterns must be 3'x3'min and 12'x12'max

Concrete – Pedway Design
• All concrete must be 6"thick, fibermesh reinforced overlying 4"of compacted ABC per NAU Technical Standards
• Concrete mix design for Pedestrian lane must contain 60% fine aggregate and 40% large aggregate to achieve sand finish
• Weather Worker 40% J29 Sealer or NAU approved equal should be applied to concrete after the 28 day curing period unless otherwise directed by NAU
• Expansion joints must align with spacing of control joints as shown in plan diagram
• Tooled joints must extend to a depth of 1/4 slab thickness
• Use 2'long, 1/2"diameter rebar dowels at 2'–6"O.C. to tie pedestrian and bike concrete together
• On–site 8' by 8' mock–up of full cross–section of Pedway required to ensure desired look is achieved. Approval by Landscape Architect required.

~SHEET~ 2 OF 5

Northern Arizona University
Department of Civil Engineering, Construction Management and Environmental Engineering

NO.	DATE	COMMENTS
1	5/14/20	
2	5/22/20	
3	5/28/20	

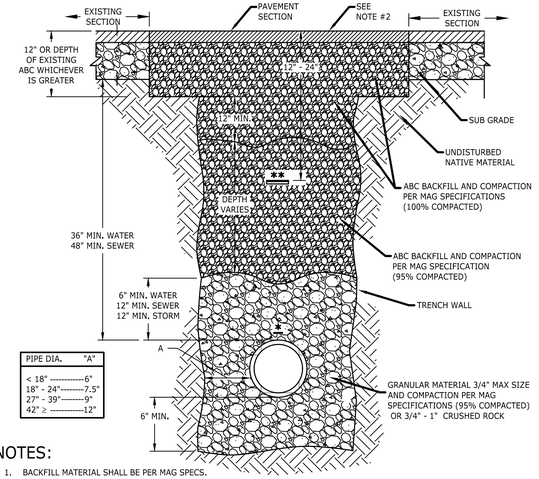
REVISIONS

DRAWN BY: MAX PEGAN
CHECKED BY: MAX PEGAN
DATE: 5/8/20
SCALE: NA

P46 DRAINAGE AND PEDWAY

GENERAL NOTES

PRODUCED BY AN AUTODESK STUDENT VERSION
PRODUCED BY AN AUTODESK STUDENT VERSION



NOTES:

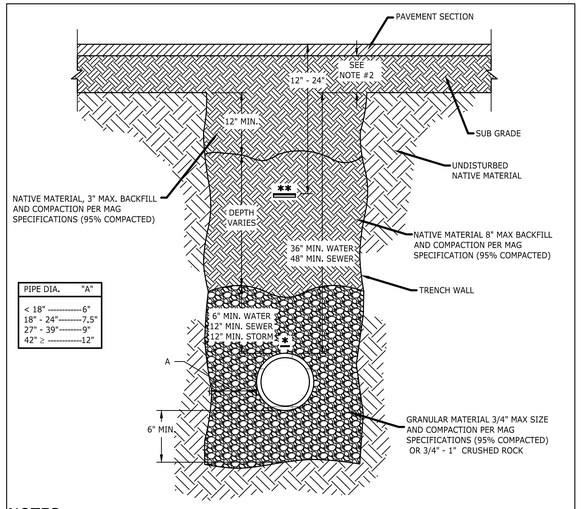
1. BACKFILL MATERIAL SHALL BE PER MAG SPECS.
2. THE DEPTH OF THE AC SHALL MATCH EXISTING OR TYPICAL MIN. PAVEMENT DEPTH FOR THE TYPE OF ROADWAY, WHICHEVER IS GREATER. THE TYPICAL MINIMUM PAVEMENT DEPTHS ARE AS FOLLOWS: ARTERIAL = 5", COLLECTOR = 4", LOCAL = 3"
3. NON-SHRINK BACKFILL IN ACCORDANCE WITH COF STD. 9-6-030 AND MAY BE USED FOR BACKFILL UP TO EXISTING SUBGRADE. THE NON-SHRINK BACKFILL SHALL BE PROPORTIONED AS FOLLOWS: 2600 LBS OF 3/8" MINUS AGGREGATE, 800 LBS SAND, 94 LBS CEMENT AND 11 GALLONS WATER.
4. A MIN. 2" OF UPM™ MAY BE USED FOR TEMPORARY TRENCH PAVING IF HOT MIX IS NOT AVAILABLE. UPM™ TEMPORARY PAVEMENT SHALL NOT REMAIN IN PLACE LONGER THAN 5 WORKING DAYS OR UNTIL HOT MIX ASPHALT IS AVAILABLE. AFTER 5 WORKING DAYS, THE CITY MAY PERFORM THE PERMANENT TRENCH PAVEMENT AT THE CONTRACTORS EXPENSE. IN LIEU OF PLACING UPM™ THOUGH STILL TEMPORARY, THE CONTRACTOR MAY ELECT TO COMPLETELY BACKFILL THE TRENCH TO WITHIN 2" OF THE FINISH TRENCH GRADE WITH NON-SHRINK BACKFILL; THE FINAL 2" SHALL BE MAG CLASS "C" CONCRETE

* TRACER WIRE TAPED TO TOP CENTER OF MAIN WITH 10MIL PVC TAPE ON 4' CENTERS, SEE COF STD 9-01-020.

** WARNING TAPE

NTS

City of Flagstaff	'TRENCHING & BACKFILL' EXISTING PAVED STREET		
ENGINEERING DETAIL	DETAIL NO. 09-01-030	REVISION DATE: 12/30/2017	1 / 1



NOTES:

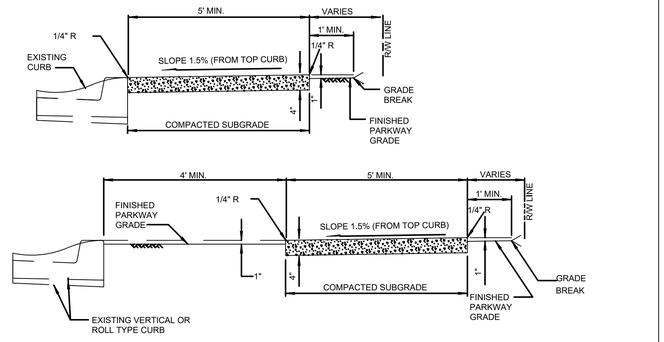
1. NATIVE BACKFILL SHALL BE PER MAG SPECS AND MAY BE SELECTED FROM THE EXCAVATION MATERIAL OR FROM A SOURCE SELECTED BY THE CONTRACTOR AND APPROVED BY THE CITY ENGINEER.
2. NEW PAVEMENT SHALL BE 2 1/2" AC OVER 4" ABC, OR 4" PORTLAND CEMENT CONCRETE, OR DEPTH OF EXISTING PAVEMENT, WHICHEVER IS GREATER.
3. NON-SHRINK BACKFILL IN ACCORDANCE WITH COF STD. 9-6-030 AND MAY BE USED FOR BACKFILL UP TO EXISTING SUBGRADE. THE NON-SHRINK BACKFILL SHALL BE PROPORTIONED AS FOLLOWS: 2600 LBS OF 3/8" MINUS AGGREGATE, 800 LBS SAND, 94 LBS CEMENT AND 11 GALLONS WATER

* TRACER WIRE TAPED TO TOP CENTER OF MAIN WITH 10MIL PVC TAPE ON 4' CENTERS, SEE COF STD 9-01-020.

** WARNING TAPE

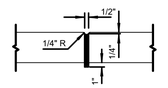
NTS

City of Flagstaff	TRENCHING AND BACKFILL EXISTING PAVED PARKING LOT		
ENGINEERING DETAIL	DETAIL NO. 09-01-033	REVISION DATE: 12/30/2017	1 / 1

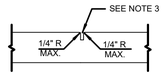


NOTES:

1. SIDEWALK CONSTRUCTION SHALL CONFORM TO SECTION 340.
2. EXPANSION JOINTS SHALL BE 1/2" BITUMINOUS TYPE PREFORMED EXPANSION JOINT FILLER, PER SECTION 729.
3. LARGE AGGREGATE, IN CONTRACTION JOINT SHALL BE SEPARATED TO A DEPTH OF 1". FINISH DEPTH SHALL BE A MINIMUM OF 3/4".
4. EXPANSION JOINTS SHALL CONFORM TO SECTION 340, BE INSTALLED PRIOR TO CONCRETE PLACEMENT, AND AT A MAXIMUM SPACING OF 50'.
5. CONCRETE SHALL BE CLASS 'B' PER SECTION 725.
6. WHEN SIDEWALK AND ADJACENT CURB ARE CONSTRUCTED MONOLITHICALLY, ALL EXPANSION AND CONTRACTION JOINTS SHALL EXTEND ACROSS THE CURB.

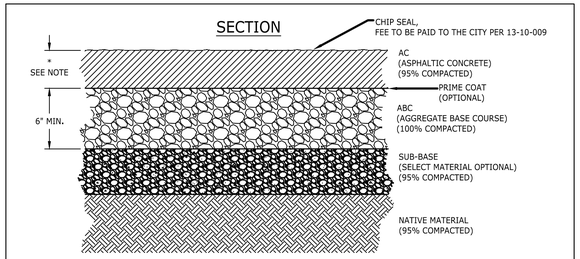


EXPANSION JOINT



CONTRACTION JOINT

DETAIL NO.	MARICOPA ASSOCIATION of GOVERNMENTS	STANDARD DETAIL ENGLISH	SIDEWALKS	REVISED	DETAIL NO.
230				01-01-2014	230



* THE MINIMUM DEPTH OF THE AC VARIES, DEPENDING ON THE TYPE OF ROADWAY. THE TYPICAL MINIMUM PAVEMENT DEPTHS ARE AS FOLLOWS, OR MATCH EXISTING, WHICHEVER IS GREATER.

ARTERIALS = 5"
COLLECTORS = 4"
LOCALS & ALLEYS = 3"

OFF-STREET PARKING MINIMUM DEPTH OF AC IS 2 1/2"
PARKING LOTS MAY BE PAVED WITH 4" PORTLAND CEMENT CONCRETE UPON COMPACTED SUBGRADE.

ALTERNATIVE SECTIONS:

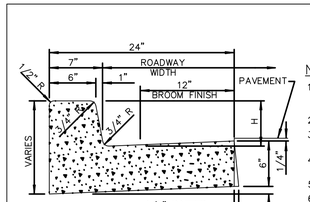
1. FOR PARKING LOTS, ALTERNATIVE SECTIONS OF PAVEMENT WILL BE CONSIDERED (i.e. PAVERS, POROUS ASPHALT AND CONCRETE, GRASS CRETE, GRAVEL PAVE, ETC.)

NOTES:

1. ALTERNATIVE SECTIONS SHALL BE LIMITED TO THE PARKING AREAS AND DRIVE AISLES THAT DO NOT SERVE AS FIRE ACCESS AISLES.
2. THE PROFESSIONAL ENGINEER MAY RECOMMEND PAVEMENT STRUCTURAL SECTION THAT ARE EQUIVALENT TO THE MINIMUM SECTIONS ABOVE.

NTS

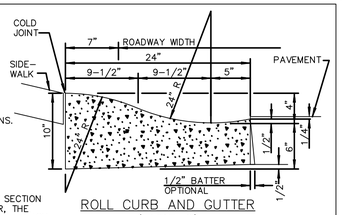
City of Flagstaff	PAVEMENT STRUCTURAL SECTIONS for STREETS & OFF-STREET PARKING LOTS		
ENGINEERING DETAIL	DETAIL NO. 10-09-010	REVISION DATE: 12/30/2017	1 / 1



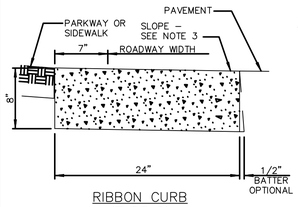
VERTICAL CURB AND GUTTER (TYPE A)

NOTES: (TYPE A)

1. ALL EXPOSED SURFACES TO BE TROWEL FINISHED EXCEPT AS SHOWN. SEE SECT. 340.
2. H=6" OR AS SPECIFIED ON PLANS.
3. CONTRACTION JOINT SPACING 10' MAXIMUM.
4. EXPANSION JOINTS AS PER SECT. 340.
5. CLASS 'B' CONCRETE PER 725.
6. WHEN THE ADJACENT PAVEMENT SECTION SLOPES AWAY FROM THE GUTTER, THE SLOPE OF THE GUTTER PAN SHALL MATCH PAVEMENT CROSS SLOPE.



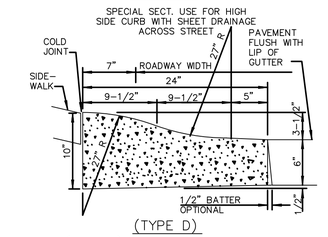
ROLL CURB AND GUTTER (TYPE C)



RIBBON CURB (TYPE B)

NOTES: (TYPE B)

1. CONSTRUCT CURB AND INSTALL 1/2" MASTIC EXPANSION JOINTS, A.S.T.M. D-1751. SECT. 340.
2. BROOM FINISH ALL SURFACES.
3. RIBBON CURB MAY SLOPE TOWARDS PAVEMENT OR PARKWAY AS INDICATED ON PLANS.
4. CONTRACTION JOINT SPACING 10' MAXIMUM.
5. CONCRETE SHALL BE CLASS 'B' PER SECT. 725 AND INSTALLED PER SECT. 505.

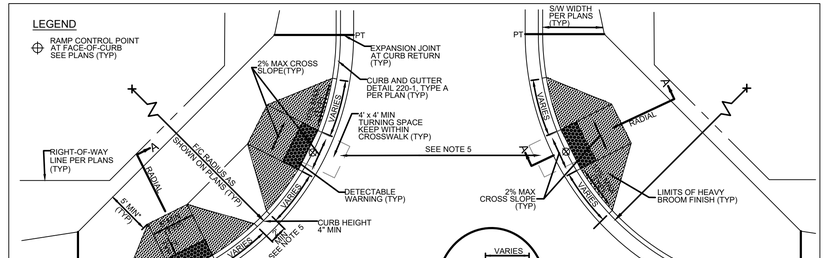


(TYPE D)

NOTES: (C & D)

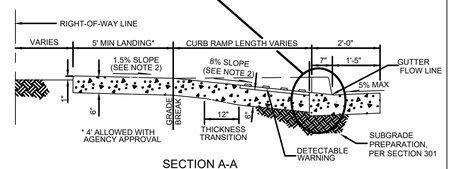
1. ALL WORK AND MATERIALS SHALL CONFORM TO SECT. 304, 505 AND 725. BROOM FINISH TO EXPOSED SURFACE.
2. CONTRACTION JOINT SPACING 10' MAXIMUM.
3. EXPANSION JOINTS AS PER SECT. 340.
4. CLASS 'B' CONCRETE PER 725.

DETAIL NO.	MARICOPA ASSOCIATION of GOVERNMENTS	STANDARD DETAIL ENGLISH	CURB AND GUTTER TYPES A, B, C AND D	REVISED	DETAIL NO.
220-1				01-01-2007	220-1



NOTES:

1. CLASS 'A' CONCRETE PER SECTION 725, PC TO PT.
2. CONSTRUCTION INCLUDING JOINTS AND MAXIMUM SLOPES SHALL CONFORM TO SECTION 340.
3. WALKWAY SURFACE TO MATCH 1.5% SLOPE FROM TOP OF CURB.
4. DETECTABLE WARNING IS TO COMPLY WITH THE JURISDICTIONAL AGENCY'S REQUIREMENTS.
5. DISTANCE BETWEEN RAMPS MAY BE ADJUSTED TO IMPROVE ALIGNMENT WITH RECEIVING RAMP WHEN ALLOWED BY THE JURISDICTIONAL AGENCY.
6. SPECIAL DESIGN IS REQUIRED FOR GUTTER GRADES GREATER THAN 2%.



SECTION A-A

DETAIL NO.	MARICOPA ASSOCIATION of GOVERNMENTS	STANDARD DETAIL ENGLISH	25' - 35' R - RADIAL CURB RAMP ATTACHED SIDEWALK	REVISED	DETAIL NO.
236-1				01-01-2018	236-1

~SHEET~ 3 OF 5

Northern Arizona University
Department of Civil Engineering, Construction Management and Environmental Engineering

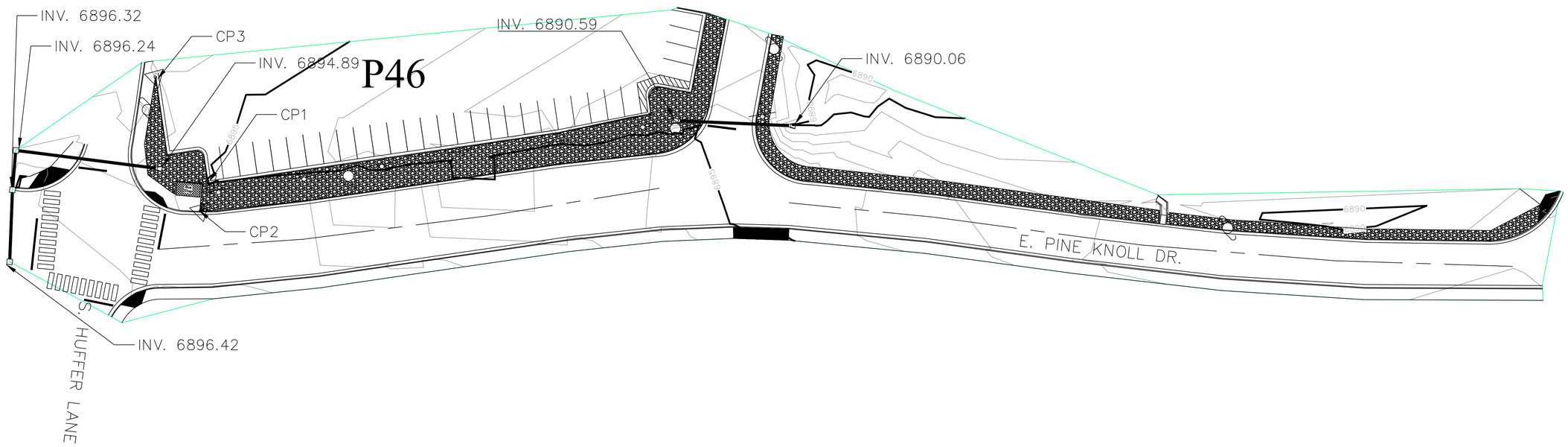
NO.	DATE	COMMENTS

DRAWN BY: MAX REGAN
CHECKED BY: MAX REGAN
DATE: 5/8/20
SCALE: NA

P46 DRAINAGE AND PEDWAY

DETAILS

PROJECT CONTROL POINTS			
CONTROL POINT	NORTHING	EASTING	ELEVATION
CP1	1519226.7787	780154.6104	6895.2900
CP2	77808.8920	1519277.0510	6898.9200
CP3	77808.8920	1519277.0510	6898.9200



COORDINATE SYSTEM	
TRANSVERSE MERCATOR	
AZ STATE PLANE CENTERED	
SYSTEM	INTERNATIONAL FEET
HORIZONTAL DATUM	AZ NAD83
VERTICAL DATUM	NGBD85

0 7.5 15 30
SCALE: 1" = 30'

~SHEET~
4 OF 5

Northern Arizona University
Department of Civil Engineering, Construction Management and Environmental Engineering

NO.	DATE	COMMENTS
1	4/14/20	
2	4/22/20	
3	4/28/20	

DRAWN BY: MAX REGAN
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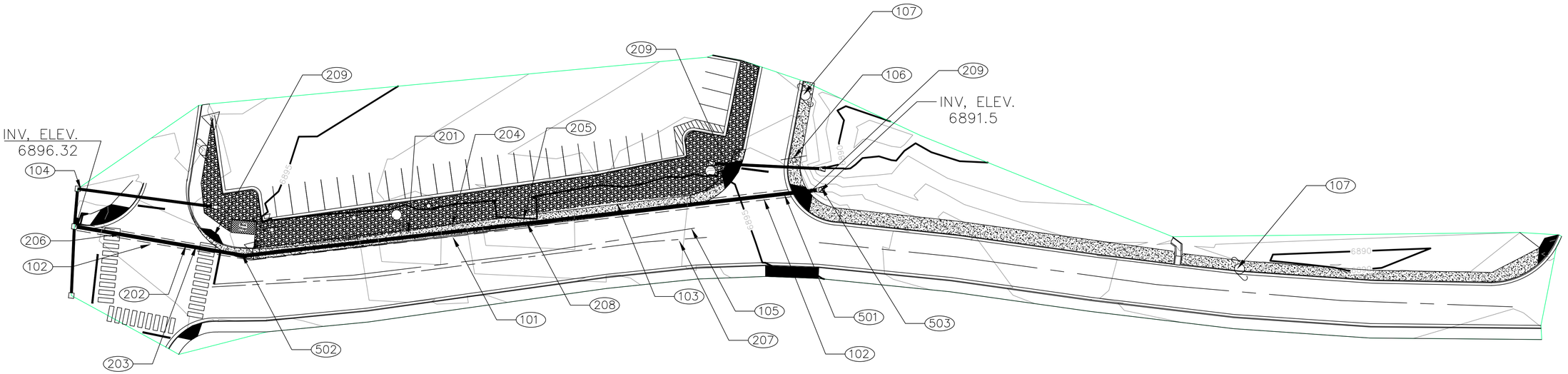
SCALE: 1" = 30'

P46 DRAINAGE AND PEDWAY
RESULTS OF SURVEY

PRODUCED BY AN AUTODESK STUDENT VERSION



101 SAW CUT ASPHALT TO PROPOSED GUTTER LINE (340 LF)

102 SAW CUT ASPHALT TO TRENCH LIMITS (266 LF)

103 REMOVE EXISTING CURB AND GUTTER (340 LF)

104 EXISTING 18" CMP TO BE CAPPED AND ABANDONED (1 EA)

105 GRIND EXISTING CENTER LINE STRIPING (268 LF)

106 REMOVE AND RELOCATE SIGN (1 EA)

107 REMOVE AND RELOCATE LIGHT POLE (2 EA)

201 FINE GRADE SIDEWALK (642 SY)

202 FINE GRADE TRENCH (59 SY)

203 PLACE TRENCH ABC PER COF STD DET 09-01-030 (59 SY)

204 PLACE SIDEWALK ABC PER MAG STD DET 230 (642 SY)

205 INSTALL 6' SIDEWALK (CLASS AA CONCRETE) PER MAG STD DET 230 (825 LF)

206 TRENCH PAVE (T-TOP) PER COF STD DET 09-01-030 (133 LF)

207 PLACE CENTER LINE STRIPING (268 LF)

208 INSTALL CURB AND GUTTER PER MAG STD DET 220-1 TYPE A (375 LF)

209 INSTALL SIDEWALK RAMP PER MAG STD DET 236-1 (3 EA)

501 INSTALL 24" CMP @ 1.2% SLOPE (414 LF)

502 INSTALL LONG RADIUS BEND PER COF DRAINAGE DESIGN SPECS. (414 LF)

503 INSTALL CULVERT OUTLET 30 DEG. BEVELED RING TYPE (1 EA)

0 7.5 15 30
SCALE:1"=30'

~SHEET~
5 OF 5

Northern Arizona University
Department of Civil Engineering, Construction Management and Environmental Engineering

NO.	DATE	COMMENTS
1	3/14/20	
2	4/22/20	
3	4/28/20	

DRAWN BY: MAX REGAN
CHECKED BY: MAX REGAN
DATE: 5/8/20
SCALE: 1"=30'

P46 DRAINAGE AND PEDWAY IMPROVEMENT PLAN

PRODUCED BY AN AUTODESK STUDENT VERSION

PRODUCED BY AN AUTODESK STUDENT VERSION