GENERAL NOTES

1. OWNER/DEVELOPER:
   TUCSON ELECTRIC POWER COMPANY
   MAIL STOP HQE611
   PO BOX 711
   TUCSON, ARIZONA 85702

2. THE EXISTING ZONE IS **SR**, NO ZONE CHANGE REQUESTED FOR THIS PROJECT. A SPECIAL EXCEPTION FOR THE PROPOSED USE HAS BEEN APPROVED UNDER CITY OF TUCSON ACTIVITY #T21SE00006.

3. THE EXISTING USE IS STORAGE. THE PROPOSED USE OF THE DEVELOPMENT IS **DISTRIBUTION SYSTEM: GENERAL** AND IS SUBJECT TO USE SPECIFIC STANDARDS 4-9.11. A.1, .2, .5, .8, .9 AND .11.

4. THE GROSS SITE AREA IS **687,342.5** SQUARE FEET, OR **15.78** ACRES.

5. THE TOTAL ON-SITE DISTURBED AREA FOR THIS DEVELOPMENT IS APPROXIMATELY **687,342.5** SF. THE TOTAL OFF-SITE DISTURBED AREA IS APPROXIMATELY **4,780** SF.

6. THE TOTAL BUILDING FLOOR AREA = **1636** SF (UNMANNED SWITCHGEAR SHELTER AND UNMANNED CONTROL SHELTER).

7. THE ASSESSOR'S PARCEL NUMBER(S) FOR THIS PROJECT IS **136-27-0010**.

8. THE DEVELOPER, ANY SUCCESSORS AND ASSIGNS, WILL HOLD THE CITY OF TUCSON, ITS OFFICERS, EMPLOYEES, AND AGENTS HARMLESS FROM ANY AND ALL CLAIMS FOR DAMAGES RELATED TO THE USE OF THIS SITE PLAN AS SHOWN HEREON, NOW AND IN THE FUTURE, BY REASON OF FLOODING, FLOWAGE, EROSION, OR DAMAGE CAUSED BY WATER, WHETHER SURFACE FLOOD OR RAINFALL.

9. DRAINAGE WILL REMAIN IN ITS NATURAL STATE AND WILL NOT BE ALTERED, DISTURBED, OR OBSTRUCTED OTHER THAN AS SHOWN ON THIS SITE PLAN.

10. NO STRUCTURE OR VEGETATION SHALL BE LOCATED OR MAINTAINED SO AS TO INTERFERE WITH THE SIGHT VISIBILITY TRIANGLES IN ACCORDANCE WITH SEC. 10-01.5.0, SIGHT VISIBILITY, OF THE TECHNICAL STANDARDS MANUAL.

11. ANY RELOCATION, MODIFICATION, ETC., OF EXISTING UTILITIES AND/OR PUBLIC IMPROVEMENTS NECESSITATED BY THE PROPOSED DEVELOPMENT WILL BE AT NO EXPENSE TO THE PUBLIC.

12. THERE ARE NO EXISTING OR PROPOSED SEWERS.

13. DIMENSIONAL STANDARDS PER U.D.C. SEC. 6.3 FOR SR ZONE:

SITE COVERAGE CALCULATION:
MAXIMUM = 15%
ACTUAL = 3,332/687,342.5 = 0.5%

MAXIMUM ALLOWED BUILDING HEIGHT = 30'

BUILDING SETBACKS:

		REQUIRED	PROVIDED
NORTH (STREET, FRONT)	-	5'	192.5' MIN.
EAST (STREET)	-	20'	477.0' MIN.
SOUTH	-	20'	340.4' MIN.
WEST	-	20'	462.6' MIN.

14. THE FACILITY IS AN UNMANNED ELECTRIC SUBSTATION. NO PEDESTRIAN OR BICYCLE ACCESS IS ALLOWED. NO WALKWAYS OR BICYCLE RACKS ARE PROPOSED OR REQUIRED AND NO VEHICLE PARKING SPACES OR OFF-STREET LOADING SPACES ARE REQUIRED OR PROVIDED.

15. NO FREESTANDING MONUMENT SIGNS OR PARKING AREA LIGHTING ARE PROPOSED WITHIN THIS DEVELOPMENT.

16. NO MAIL SERVICE.

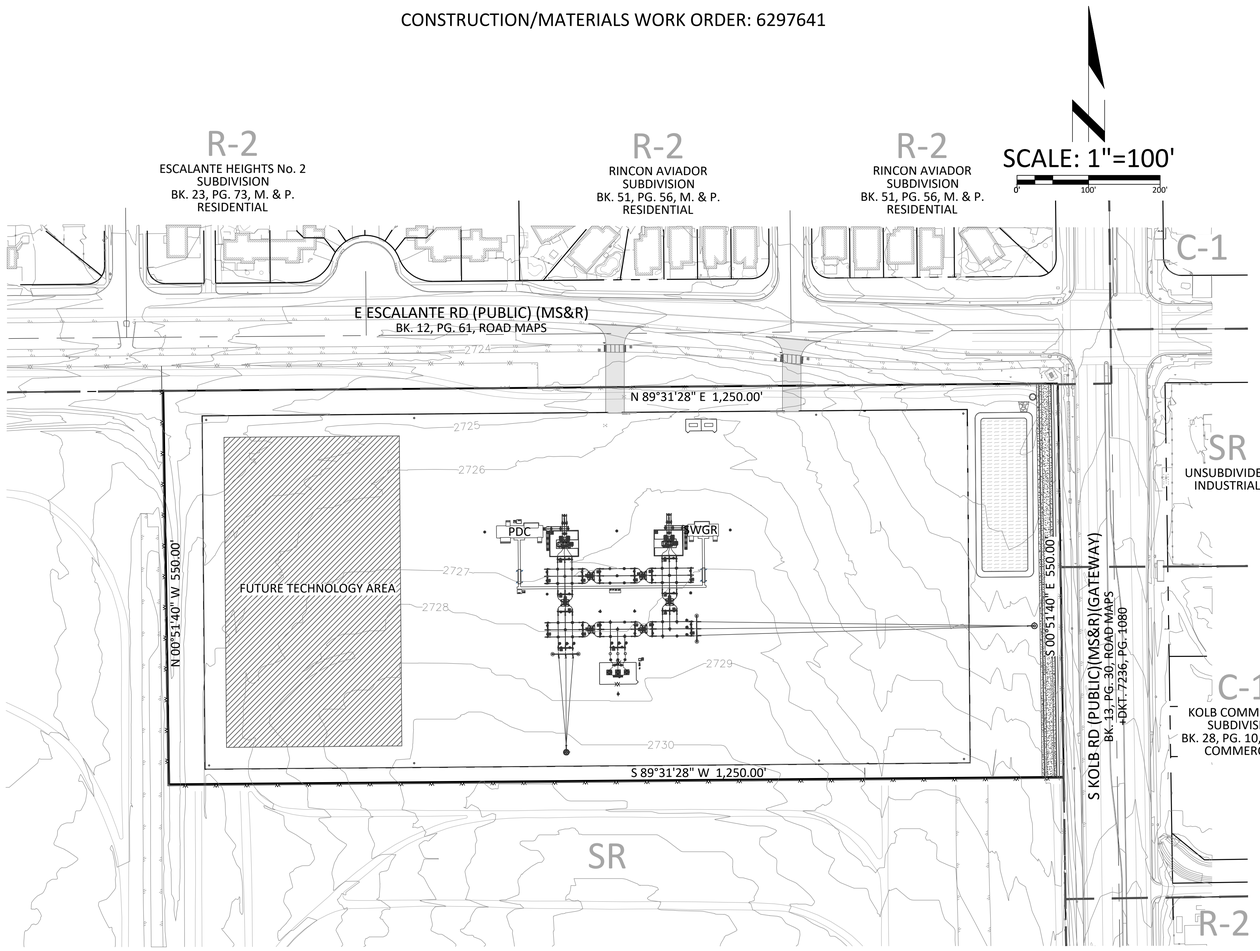
17. WASTE STREAM CALCULATION:

THIS SITE DOES NOT GENERATE SOLID WASTE.

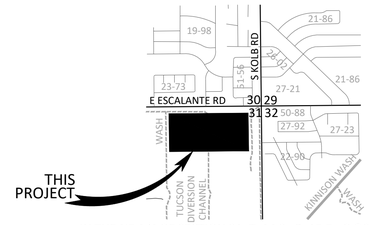
18. THE PROJECT IS DESIGNED TO MEET THE OVERLAY ZONE CRITERIA FOR: UDC SEC. 5.4, MAJOR STREETS AND ROUTES SETBACK ZONE (MS&R); UDC SEC. 5.5. GATEWAY CORRIDOR ZONE (GCZ); UDC SEC. 5.6, AIRPORT ENVIRONS ZONE (AEZ).

19. THE PROPOSED USE OF THIS PROJECT (ELECTRICAL SUBSTATION) WAS APPROVED ON _____. THERE IS A SPECIAL EXCEPTION PROCESS, SPECIAL EXCEPTION CASE NO. _____ (CITY OF TUCSON ACTIVITY #T21SE00006) WITH THE FOLLOWING CONDITIONS:
   1.
   2.

CONSTRUCTION/MATERIALS WORK ORDER: 6297641



PROJECT OVERVIEW PLAN



IN THE NE 1/4 OF SECTION 31, T. 14 S., R. 15 E., G.&S.R.M., CITY OF TUCSON, PIMA COUNTY, ARIZONA

LOCATION MAP

NORTH

3" = 1 MILE

LEGEND

EXISTING	PROPOSED	
		SUBJECT PROPERTY BOUNDARY
		RIGHT-OF-WAY
		OTHER PARCEL LINE
		ROADWAY CENTERLINE
		ZONE BOUNDARY
2320	2580	CONTOUR
		GRADING LIMITS
		PAVEMENT EDGE
		CURB
		FENCE
		WALL
		POWER POLE
OHE		OVERHEAD ELECTRIC
L		LIGHT PULL BOX
TL		TRAFFIC LIGHT PULL BOX
G		GAS MARKER
G		GAS VALVE
		SEWER MANHOLE
S		SEWER PIPE
SD		STORM DRAIN PIPE
SD		STORM DRAIN MANHOLE
		TRAFFIC LIGHT
W		WATER METER
		WATER VALVE

OWNER / DEVELOPER

TUCSON ELECTRIC POWER COMPANY
MAIL STOP HQE611
PO BOX 711
TUCSON, ARIZONA 85702
PH: (520) 396-2551
CONTACT: JESUS MARTINEZ
E: jmartinez@tep.com

SHEET INDEX

LANDSCAPE ARCHITECT

ARC STUDIOS INC.
3117 EAST FLOWER STREET
TUCSON, ARIZONA 85716
ATTN: ERIC BARRETT
PH: (520) 882-9655
E: erb@arcstudiosinc.com

Registered Professional Engineer (Civil) CERTIFICATE NO. 37624 KEVIN M. HALL Date Signed 04.29.2021 ARIZONA, U.S.A.

CYPRESS CIVIL

SCALE AS NOTED
APRIL 2021

2030 east speedway boulevard
suite #110
tucson, arizona 85719
ph: 520.499.2456
e: info@cypresscivil.com

CYPRESS CIVIL PROJECT NO: 20.116

JOB NO. 10449.00
COVER SHEET
DEVELOPMENT PACKAGE

FOR

TEP PATRIOT SUBSTATION

PARCEL TBD
LOCATED IN NE 1/4 OF SECTION 31, T 14 S, R 15 E, G&SRM, CITY OF TUCSON, PIMA COUNTY, ARIZONA

DP ___

REF: T21SE00006
COT ADMINISTRATIVE ADDRESS:
6980 EAST ESCALANTE ROAD
TUCSON, ARIZONA 85707

SHEET 1 OF 17

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811
Call 811 or click Arizona811.com

REVISIONS

DATE	ENG	TECH	REV
04/29/2021	J MARTINEZ	CYPRESS CIVIL	00

DESCRIPTION:
ISSUED FOR CONSTRUCTION
PATRIOT SUBSTATION DEVELOPMENT PLAN
JOB NO. 10449.00 / WO 6297641

VENDOR

NAME:
DRAWING #:
SHOP ORDER #:
TEP PO #:

AUTOCADD

Tucson Electric Power Company
TUCSON, ARIZONA

TITLE:
SITE DEVELOPMENT
DEVELOPMENT PLAN
PATRIOT SUBSTATION

TRSQ: T14S,15E,S31
REF #: N/A
DWG #: 0398-138-00-0001
REV: 00
SHEET: CVR

GENERAL PAVING + GRADING NOTES

1. ALL CONSTRUCTION AND TEST METHODS SHALL CONFORM TO THE PIMA ASSOCIATION OF GOVERNMENTS (PAG) STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS, VOLUMES 1 AND 2, 2015 EDITION, EXCEPT AS MODIFIED HEREIN. (MEASUREMENT AND PAYMENT TERMS DO NOT APPLY).
2. CONTRACTOR SHALL OBTAIN ALL PERMITS REQUIRED BY GOVERNMENT AGENCIES.
3. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION REGULATIONS.
4. A COPY OF THE APPROVED PLANS SHALL BE KEPT IN AN ACCESSIBLE LOCATION ON THE PROJECT SITE AT ALL TIMES DURING CONSTRUCTION.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CARE AND MAINTENANCE OF EXISTING IMPROVEMENTS AND VEGETATION IN THE WORK AREA. PAVEMENT, CURBS, AND ANY OTHER OBSTRUCTION DAMAGED DURING CONSTRUCTION SHALL BE REPLACED BY THE CONTRACTOR.
6. UPON COMMENCEMENT OF WORK, TRAFFIC CONTROL DEVICES SHALL BE POSTED AND MAINTAINED BY THE CONTRACTOR UNTIL SUCH TIME AS THE WORK IS COMPLETED. ALL WARNING SIGNS, BARRICADES, ETC. SHALL CONFORM TO THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), ADOPTED BY THE STATE OF ARIZONA PURSUANT TO A.R.S.-28-650.
7. IF UNANTICIPATED CONDITIONS ARE ENCOUNTERED DURING THE COURSE OF CONSTRUCTION AND ARE BEYOND THE SCOPE OF THE DESIGN, THE OWNER SHALL BE NOTIFIED IMMEDIATELY.
8. CONTRACTOR TO EXHIBIT EXTREME CAUTION WHEN EXCAVATING TO AVOID DAMAGING EXISTING UTILITY LINES IN AND AROUND THE AREA OF WORK. UTILITIES AS SHOWN ON THIS PLAN ARE APPROXIMATE AND NOT COMPLETE BUT ARE BASED ON THE BEST AVAILABLE INFORMATION AT THE TIME THIS PLAN WAS DESIGNED.
9. CONTRACTOR SHALL ADJUST BOTH EXISTING AND NEW WATER VALVES, BOX COVERS, WATER METER BOXES, SANITARY SEWER MANHOLE AND CLEAN-OUT RING AND COVERS, TELEPHONE AND ELECTRIC MANHOLE RING AND COVERS TO THE NEW FINISHED GRADE.
10. PROJECT EARTHWORK (UNADJUSTED)(APPROXIMATE):

TOTAL CUT	TOTAL FILL	COMPOSITE
10,231 CY	**9,921 CY**	**310 CY (C)**

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CALCULATE HIS OWN EARTHWORK QUANTITIES AND SUBMIT HIS BID THEREON. EARTHWORK QUANTITIES SHOWN HEREON ARE ESTIMATED FOR PERMITTING PURPOSES ONLY AND ARE NOT TO BE USED FOR BIDDING OR PAYMENT QUANTITIES.

11. THE CONTRACTOR SHALL VERIFY ALL QUANTITIES, INCLUDING EXCAVATION, BORROW EMBANKMENT, SHRINK OR SWELL, GROUND COMPACTION, HAUL AND ANY OTHER ITEMS AFFECTING THE BID TO COMPLETE THE GRADING TO THE ELEVATIONS SHOWN ON THESE PLANS AND TO BASE THE BID SOLELY UPON HIS OWN CALCULATED QUANTITIES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE OWNER/DEVELOPER PRIOR TO CONSTRUCTION OF ANY MAJOR DISCREPANCIES ON THE PLANS. ALL GRADE ADJUSTMENTS SHALL BE APPROVED IN WRITING BY THE OWNER PRIOR TO MAKING ANY CHANGES.
12. THE CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOBSITE CONDITIONS DURING THE COURSE OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER AND CYPRESS CIVIL HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF CYPRESS CIVIL.
13. IF THERE ARE ANY QUESTIONS REGARDING THESE PLANS OR FIELD STAKES, THE CONTRACTOR SHALL REQUEST AN INTERPRETATION BEFORE DOING ANY WORK BY CALLING CYPRESS CIVIL AT 520-499-2456.
14. CUT AND FILL SLOPES SHALL BE TRIMMED TO THE FINISH GRADE TO PRODUCE A SMOOTH SURFACE AND UNIFORM CROSS-SECTION. THE SLOPE OF THE EXCAVATIONS OR EMBANKMENTS SHALL BE SHAPED AND TRIMMED AS SHOWN ON THE PLANS AND LEFT IN A NEAT AND ORDERLY CONDITION. ALL STONES, ROOTS, OR OTHER WASTE MATTER EXPOSED ON EXCAVATION OR EMBANKMENT SLOPES SHALL BE REMOVED AND LEGALLY DISPOSED OF OFF-SITE BY THE CONTRACTOR.
15. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FURNISH, HAUL AND APPLY ALL WATER REQUIRED FOR COMPACTION AND FOR THE CONTROL OF DUST FROM THE CONSTRUCTION ACTIVITY. THE COST THEREOF IS TO BE INCLUDED IN THE GRADING CONSTRUCTION PRICE.
16. THE GRADING CONTRACTOR SHALL EXCAVATE AND REMOVE THE SOIL BENEATH ALL DECOMPOSED GRANITE AREAS SO THAT THE FINISHED SURFACE OF THE DECOMPOSED GRANITE WILL MATCH THE FINISHED SURFACE ELEVATION AS CALLED OUT ON THESE PLANS. WATER HARVESTING AREAS SHALL BE KEPT LOW TO ACHIEVE FULL DEPTH OF WATER HARVESTING TO THE FINISHED SURFACE OF THE DECOMPOSED GRANITE. SEE LANDSCAPE PLANS FOR DECOMPOSED GRANITE AREAS.

GENERAL PAVING + GRADING NOTES (cont.)

17. CYPRESS CIVIL HEREBY CERTIFIES THAT ALL FINISHED GRADED AND PAVED AREAS CONTAINED WITHIN THIS DEVELOPMENT ARE DESIGNED WITH SLOPES OF AT LEAST 0.5%. CYPRESS CIVIL FURTHER CERTIFIES THAT THE PROPOSED DESIGN PROVIDES POSITIVE DRAINAGE THROUGHOUT THE DEVELOPMENT EXCEPT WITHIN DETENTION/RETENTION AREAS OR WATER HARVESTING AREAS SPECIFIED WITHIN THE APPROVED DRAINAGE ANALYSIS FOR THIS PROJECT.
18. LANDSCAPE AREAS SHALL BE DEPRESSED TO MAXIMIZE STORM WATER HARVESTING IN AREAS SHOWN ON LANDSCAPE AND/OR GRADING PLANS. WATER HARVESTING SHALL NOT OCCUR WITHIN TEN FEET (10') OF THE BUILDING FOUNDATION.
19. ALL ELEVATIONS ARE AT FINISH SURFACE OF PROPOSED ASPHALT (P). ADD 0.5' FOR THE ADJACENT TOP OF CURB/CONCRETE (TC/C) ELEVATION UNLESS OTHERWISE SHOWN.
20. CURB RADII ARE MEASURED TO FRONT FACE OF CURB.
21. ALL DIMENSIONS FOR PARKING AREA ACCESS LANES AND PARKING SPACES AS SHOWN ON THE PLAN ARE MEASURED AT THE GUTTER LINE.
22. AGGREGATE BASE COURSE SHALL CONFORM TO PAG STANDARD SPECIFICATION SECTION 303.
23. ASPHALTIC CONCRETE SHALL CONFORM TO PAG STANDARD SPECIFICATION SECTION 406, MIX NO. 2.
24. ALL CONCRETE SHALL CONFORM TO PAG STANDARD SPECIFICATION SECTION 1006, CLASS B, 2500 PSI COMPRESSIVE STRENGTH AT 28 DAYS, OR CLASS S, 3000 PSI COMPRESSIVE STRENGTH AT 28 DAYS, UNLESS OTHERWISE SPECIFIED.
25. PARKING AREA PAVEMENT MARKINGS SHALL BE IN CONFORMANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), CURRENT EDITION. THE PAINT SHALL BE WHITE UNLESS OTHERWISE INDICATED OR AS REQUIRED BY THE MUTCD.
26. THE APPROVED GRADING PLAN/DEVELOPMENT PACKAGE IS THE ONLY ACCEPTABLE CONSTRUCTION PLAN ONSITE. THE CONTRACTOR MAY NOT USE ANY OTHER PLANS, SUCH AS THE APPROVED TENTATIVE PLAT AND/OR DEVELOPMENT PLAN, FOR CONSTRUCTION PURPOSES. THE CONTRACTOR MAY ASK THE PLANNING AND DEVELOPMENT SERVICES INSPECTOR TO CONSULT WITH THE OTHER APPROVED PLANS FOR ADDITIONAL INFORMATION OR DETAILS THAT MIGHT NOT BE INCLUDED ON THE APPROVED GRADING PLAN BUT NEEDED FOR COMPLETION OF WORK.
27. THE CONTRACTOR IS NOT PERMITTED TO MAKE AN AUTONOMOUS DECISION TO CARRY OUT CONSTRUCTION FIELD CHANGES WITHOUT PRIOR WRITTEN APPROVAL FROM THE ENGINEER OF RECORD AND THE CITY OF TUCSON DEVELOPMENT SERVICES DEPARTMENT.
28. THE CONTRACTOR SHALL DETERMINE IN ADVANCE OF CONSTRUCTION IF OVERHEAD UTILITY LINES, SUPPORT STRUCTURES, POLES, GUYS, ETC. ARE AN OBSTRUCTION TO CONSTRUCTION OPERATIONS. IF ANY OBSTRUCTION TO CONSTRUCTION OPERATIONS IS EVIDENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE APPROPRIATE UTILITY OWNER TO REMOVE OR SUPPORT THE UTILITY OBSTRUCTION. ANY COST ASSOCIATED WITH THIS EFFORT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
29. IF GRADING CONSTRUCTION IS EXPECTED TO LAST LONGER THAN THE EXPIRATION DATE OF THE GRADING PERMIT, CONTACT PDSD TO RENEW/EXTEND THE GRADING PERMIT. IF FINAL GRADING INSPECTION HAS NOT BEEN COMPLETED BEFORE THE GRADING PERMIT EXPIRES, AND THE PERMIT HAS NOT BEEN RENEWED, ADDITIONAL FEES AND REVIEWS MAY BE REQUIRED.
30. THE PERMITTEE SHALL NOTIFY PDSD WHEN THE GRADING OPERATION IS READY FOR FINAL GRADING INSPECTION. FINAL GRADING APPROVAL SHALL NOT BE GIVEN UNTIL ALL WORK, INCLUDING INSTALLATION OF ALL DRAINAGE FACILITIES/IMPROVEMENTS, UTILITY TRENCHES ARE BACKFILLED, PRIVATE PAVING AND CURB, PERMANENT PROTECTIVE DEVICES, ALL EROSION CONTROL MEASURES HAVE BEEN COMPLETED, ALL CONDITIONS OF PERMITS ARE COMPLETED, IN ACCORDANCE WITH THE APPROVED GRADING PLAN AND GRADING PERMIT, AND ANY OTHER REQUIRED REPORTS THAT HAVE BEEN SUBMITTED.
31. ALL WORK SHALL CONFORM TO THE CITY OF TUCSON TECHNICAL STANDARDS MANUAL SEC.2-01.
32. CALL FOR A PRE-CONSTRUCTION MEETING PRIOR TO START OF EARTHWORK. TO SCHEDULE A PDSD PRE-CONSTRUCTION MEETING, SWPPP INSPECTION OR GENERAL ENGINEERING INSPECTIONS, CALL THE INTERACTIVE VOICE RESPONSE (IVR) SYSTEM AT 791-3111, OR SCHEDULE WITH A CUSTOMER SERVICE REPRESENTATIVE AT THE PLANNING AND DEVELOPMENT SERVICES DEPARTMENT, OR CONTACT PDSD ENGINEERING AT 791-5550, OR SCHEDULE INSPECTIONS ONLINE AT: https://www.velocityhall.com/accela/velohall/index.cfm?city=tucson&state=arizona
33. ANY REVISION TO THE GRADING PLAN **MAY** REQUIRE A RE-SUBMITTAL OF A REVISED GRADING PLAN FOR REVIEW. CONTACT PDSD ENGINEERING AT 791-5550 TO DISCUSS CHANGES IN GRADING DESIGN.
34. CONTACT PERMITS AND CODES AT 791-5100 FOR ANY QUESTIONS REGARDING ANY RIGHT-OF-WAY PERMIT REQUIREMENTS.
35. IT IS THE OWNER'S RESPONSIBILITY TO VERIFY AND MITIGATE ANY POTENTIAL CONSTRUCTION IMPEDIMENTS DUE TO EXISTING ENCROACHMENTS BY ADJACENT PROPERTY OWNERS (WHETHER SITE WALLS, FENCES, OR OTHERWISE). CYPRESS CIVIL ASSUMES NO LIABILITY NOR RESPONSIBILITY FOR ANY ENCROACHMENTS OR FOR DELAYS TO THE APPROVAL PROCESS AS A RESULT THEREOF.

EARTHWORK/MATERIALS TESTING + CERTIFICATION

1. A GEOTECHNICAL ENGINEERING INVESTIGATION, INCLUDING RECOMMENDATIONS FOR GRADING PROCEDURES HAS BEEN PREPARED BY TERRACON CONSULTANTS, INC.. ALL EARTHWORK OPERATIONS SHALL CONFORM TO THE RECOMMENDATIONS CONTAINED IN SAID REPORT, DATED NOVEMBER 20, 2020, TERRACON PROJECT NO. 63205057.
2. THE CONTRACTOR SHALL RETAIN THE SERVICES OF, AND FACILITATE THE WORK OF, AN INDEPENDENT ENGINEERING TESTING LABORATORY ACCEPTABLE TO PROVIDE THE CONSTRUCTION TESTING OF THE PROJECT EARTHWORK, ASPHALT PAVEMENT AND CIVIL CONCRETE. THE GEOTECHNICAL ENGINEER SHALL VERIFY THAT INITIAL SITE CONDITIONS CONFORM WITH THE PLANS AND SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES OBSERVED SHOULD ANY SOIL CONDITION ON THE SITE BE SUSPECT OF DETRIMENTAL CHARACTERISTICS. THE CONTRACTOR SHALL BE NOTIFIED OF CONCERNS AT LEAST TWENTY-FOUR (24) HOURS BEFORE CONSTRUCTION IS SCHEDULED TO BEGIN ON THE AFFECTED AREA.
3. DURING THE COURSE OF CONSTRUCTION, TEST RESULTS SHALL BE SUBMITTED TO THE CONTRACTOR WHICH INDICATE IF WORK IS BEING DONE IN CONFORMANCE WITH THE PLANS AND SPECIFICATIONS.

TYPICAL SLOPE TREATMENT

SLOPE GRADIENT	TREATMENT
3:1 OR FLATTER	REVEGETATED WITH NATIVE SPECIES OR PROVIDE OTHER GROUND COVERS SUCH AS NETTING OR CRUSHED ROCK
2:1 TO 3:1	HAND-PLACED RIPRAP OVER FILTER FABRIC
1:1 TO 2:1	GROUTED OR WIRE-TIED RIPRAP
1:1 OR STEEPER	STABILITY ANALYSIS OR RETAINING WALL DESIGNED BY STRUCTURAL ENGINEER

NOTES:
- SLOPE GRADIENTS ARE HORIZONTAL OR VERTICAL
- FINAL SLOPE TREATMENT SHALL BE AS PER THIS TABLE **UNLESS OTHERWISE NOTED** ON THIS PLAN OR WITHIN THE GEOTECHNICAL REPORT.
- SEE RIPRAP NOTES FOR SPECIFICATIONS.

RIPRAP NOTES

1. RIPRAP MATERIAL SHALL CONFORM TO PAG STANDARD SPECIFICATION SECTION 913. RIPRAP MATERIAL SHALL BE WELL GRADED, VARYING IN SIZE FROM 4 TO 8 INCHES (d_{50}=6"). THE RIPRAP LAYER SHALL BE 12 INCHES MINIMUM THICKNESS.
2. THE GROUT FOR THE RIPRAP SHALL CONFORM TO PAG STANDARD SPECIFICATION SECTION 914. THE TOTAL GROUT AND RIPRAP LAYER SHALL BE A MINIMUM THICKNESS OF 1.5d_{50} INCHES (d_{50}=6"). GROUT THICKNESS SHALL BE EQUAL TO 1.0d_{50} AND RIPRAP ROCK SHALL BE EMBEDDED TO A DEPTH OF 0.5d_{50}.
3. FINISH GRADE ("FG") CALLOUTS ARE TO TOP OF RIPRAP, IN APPLICABLE AREAS.

SWPPP NOTES

1. SEE THE ASSOCIATED STORM WATER POLLUTION PREVENTION PLAN AS A PART OF THIS GRADING PERMIT.
2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FULLY COMPLY WITH THE ARIZONA POLLUTANT DISCHARGE ELIMINATION SYSTEM GENERAL PERMIT IN ACCORDANCE WITH THE STORM WATER POLLUTION PREVENTION PLAN PREPARED FOR THIS PROJECT.
3. ALL REMAINING DISTURBED AREAS NOT OTHERWISE ALREADY TREATED SHALL BE STABILIZED IN A FINAL MANNER IN CONFORMANCE WITH THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) PREPARED FOR THIS PROJECT. A NOTICE OF TERMINATION TO CLOSE OUT THE SWPPP'S NOTICE OF INTENT CANNOT BE FILED WITH ADEQ UNTIL THESE FINAL STABILIZATION MEASURES ARE APPLIED.
4. THE CONTRACTOR SHALL REMOVE THE FINE MATERIALS FROM THE BOTTOM OF THE DETENTION/RETENTION BASIN AND SCARIFY THE BASIN BOTTOM ONCE THE CONSTRUCTION ACTIVITIES ARE COMPLETED IN ORDER TO REMOVE ANY FINE MATERIAL BUILD UP CAUSED BY CONSTRUCTION AND TO RESTORE SOIL PERCOLATION. INSTALL BMP'S AT THE BASIN INLET(S) TO PREVENT THE FINES FROM ENTERING THE BASIN.

SURVEY NOTES

1. THE BASIS OF BEARINGS FOR THIS PROJECT IS THE NORTH LINE OF THE NORTHEAST QUARTER OF SECTION 31, TOWNSHIP 14 SOUTH, RANGE 15 EAST, GILA AND SALT RIVER MERIDIAN, PIMA COUNTY, ARIZONA. THE BEARING OF SAID LINE IS **S 89°31'28" W** PER THE PIMA COUTY DEPARTMENT OF TRANSPORTATION (PCDOT) GEODETIC CONTROL SYSTEM.
2. THE BASIS OF ELEVATIONS FOR THIS PROJECT IS THE PIMA COUNTY DEPARTMENT OF TRANSPORTATION (PCDOT) CONTROL POINT T14S-R15E-V03, BEING A TWO INCH BRASS CAP SURVEY MONUMENT, LS 4785, IN CONCRETE, MARKING THE NORTH QUARTER CORNER OF SECTION 31, TOWNSHIP 14 SOUTH, RANGE 15 EAST, GILA AND SALT RIVER MERIDIAN, PIMA COUNTY, ARIZONA. THE ELEVATION OF SAID BENCHMARK IS **2708.06'**, NAVD 88 DATUM.
3. THE SURVEY FOR THIS PROJECT WAS PERFORMED BY:
   PUTT LAND SURVEYING, INC.
   4817 EAST FIFTH STREET
   TUCSON, ARIZONA 85711
   ATTN: MR. PAUL M. COTE, AZ RLS #50761
   PH: (520) 512-8373
4. THE CONTRACTOR SHALL RETAIN THE SERVICES OF A REGISTERED LAND SURVEYOR TO PROVIDE THE CONSTRUCTION LAYOUT. THE SURVEYOR SHALL VERIFY THE KNOWN BENCHMARK AND COMPARE THE SITE CONDITIONS WITH THE PLANS AND SHALL NOTIFY THE OWNER OF ANY DISCREPANCIES OBSERVED SHOULD ANY BENCHMARK, GRADE OR DESIGN INDICATED ON THE PLANS BE SUSPECT. THE OWNER SHALL BE NOTIFIED OF SAID BENCHMARK, GRADE OR DESIGN PROBLEM AT LEAST TWENTY-FOUR (24) HOURS BEFORE CONSTRUCTION IS SCHEDULED TO BEGIN IN THE AFFECTED AREA.
5. UPON COMPLETION OF THE WORK, THE CONTRACTOR AND HIS SURVEYOR SHALL CERTIFY IN WRITING TO THE OWNER THAT THE PROJECT CIVIL ENGINEERING IMPROVEMENTS WERE STAKED AND BUILT IN SUBSTANTIAL CONFORMANCE TO THE LINES AND GRADES SHOWN. UNLESS NOTED OTHERWISE, SUBSTANTIAL CONFORMANCE SHALL MEAN THAT BUILDING SITES HAVE BEEN CONSTRUCTED TO WITHIN 0.10± FEET OF FINISH BUILDING PAD ELEVATIONS AS DESIGNED BY THE ENGINEER. PARKING AREAS SHALL BE CONSTRUCTED TO WITHIN 0.10± FEET OF FINISH GRADE AS DESIGNED BY THE ENGINEER. SITE FEATURES SHALL BE WITHIN 0.25 FEET OF SPECIFIED POSITION.

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811
Call 811 or click Arizona811.com

Registered Professional Engineer Cert. CERTIFICATE NO. 37624 KEVIN M. HALL Date Signed 04-29-2021 ARIZONA, U.S.A.

CYPRESS CIVIL

SCALE AS NOTED
APRIL 2021

2030 east speedway boulevard
suite #110
tucson, arizona 85719
ph: 520.499.2456
e: info@cypresscivil.com

CYPRESS CIVIL PROJECT NO: 20.116

NOTES
DEVELOPMENT PACKAGE
FOR
TEP PATRIOT SUBSTATION
PARCEL TBD
LOCATED IN NE 1/4 OF SECTION 31, T 14 S, R 15 E, G&SRM,
CITY OF TUCSON, PIMA COUNTY, ARIZONA
DP ___
REF: T21SE00006
COT ADMINISTRATIVE ADDRESS:
6980 EAST ESCALANTE ROAD
TUCSON, ARIZONA 85707

REVISIONS

DATE	ENG	TECH	REV
04/29/2021	J MARTINEZ	CYPRESS CIVIL	00

DESCRIPTION:
ISSUED FOR CONSTRUCTION
PATRIOT SUBSTATION DEVELOPMENT PLAN
JOB NO. 19449.00 / WO 6297641

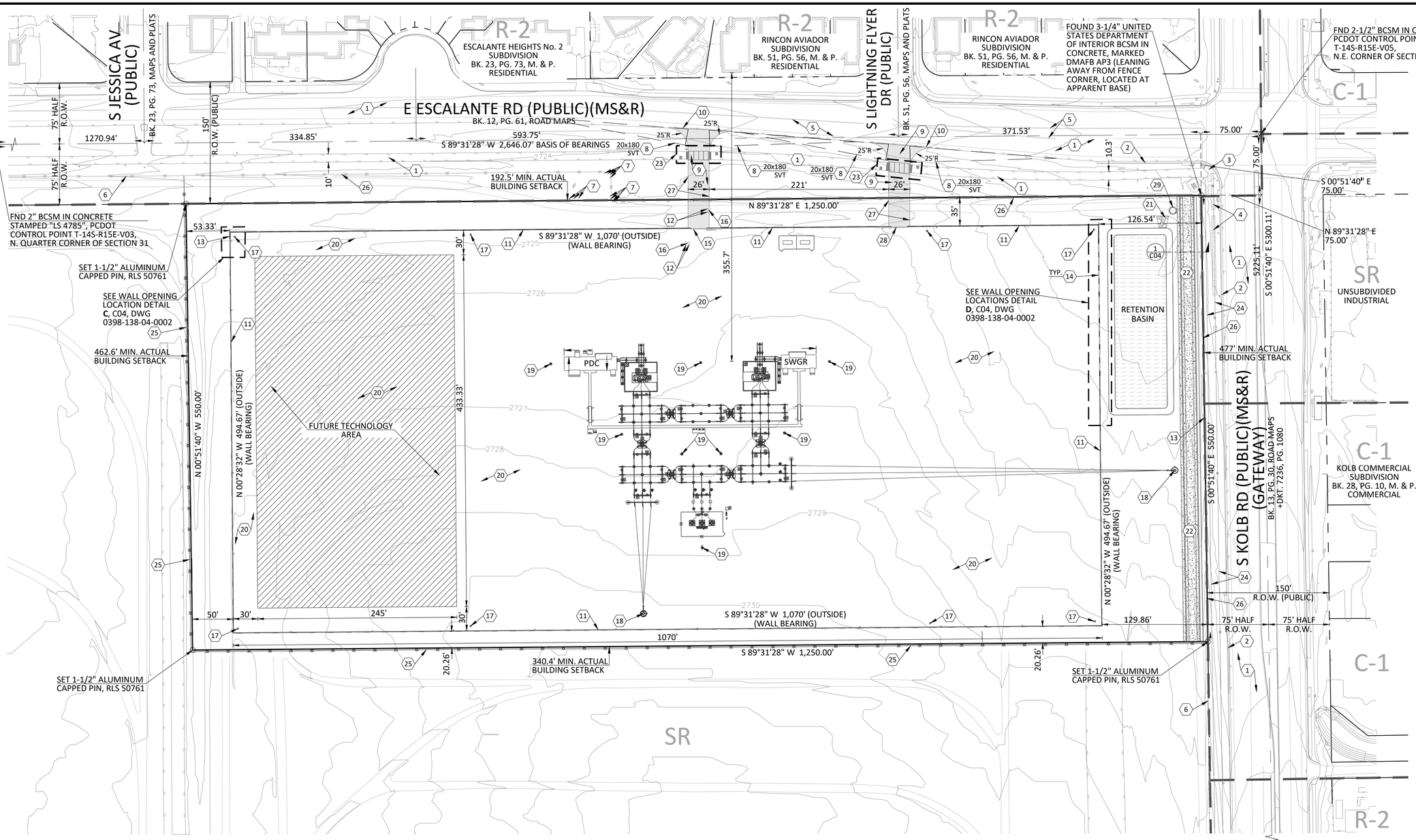
VENDOR

NAME: DRAWING #: SHOP ORDER #: TEP PO #:

AUTOCADD

Tucson Electric Power Company
TUCSON, ARIZONA
TEP
TITLE: CONSTRUCTION AND ENGINEERING NOTES
CYPRESS CIVIL, DEVELOPMENT PLAN
PATRIOT SUBSTATION

TRSQ T14S,15E,S31
REF # N/A
CWO # 0398-138-43-0001
REV 00 SHEET CO1



KEYNOTES

1. EXISTING ASPHALT TO REMAIN.
2. EXISTING CURB TO REMAIN.
3. EXISTING CURB ACCESS RAMP TO REMAIN.
4. EXISTING CONCRETE/SIDEWALK TO REMAIN.
5. EXISTING STRIPING TO REMAIN.
6. EXISTING FENCE TO REMAIN.
7. EXISTING BOLLARD/POST TO REMAIN OR REMOVED BY OTHERS.
8. SIGHT VISIBILITY TRIANGLE FOR PROPOSED DEVELOPMENT. SEE KEYNOTE FOR DIMENSIONS.
9. NEW 3" AC PAVEMENT OVER 6" ABC. COMPACT ABC TO 100%. SEE DETAIL **A**, C04, DWG 0398-138-04-0002.
10. SAWCUT A MINIMUM OF 12" INTO THE EXISTING PAVEMENT. REMOVE EXISTING ASPHALT, TACK AND JOIN.
11. NEW 12' WALL PER SEPARATE PLAN AND PERMIT.
12. NEW POST BARRICADE (TYPE A) PER PAG DETAIL 106.
13. NEW WALL OPENING. SEE DETAIL **B**, C04, DWG 0398-138-04-0002. SEE DETAIL **C**, C04, DWG 0398-138-04-0002 FOR LOCATION.
14. NEW WALL OPENING. SEE DETAIL **D**, C04, DWG 0398-138-04-0002. SEE DETAIL **E**, C04, DWG 0398-138-04-0002.
15. NEW VEHICULAR ACCESS GATE, MECHANICAL. OWNER TO PROVIDE DETAILS/FINISHES.
16. NEW CARD READER. OWNER TO PROVIDE DETAILS/FINISHES.
17. NEW SECURITY CAMERA. OWNER TO PROVIDE DETAILS/FINISHES.
18. NEW DROP-IN TRANSMISSION STRUCTURE PER SEPARATE PLANS.
19. NEW 70' LIGHTNING MAST, PER SEPARATE PLANS.
20. NEW 4" THICK LIME TREATED STABILIZED AGGREGATE BASE OVER SUBGRADE. SUBGRADE SCARIFIED TO 10" MINIMUM DEPTH AND COMPACTED 95% MINIMUM. STANDARD ACROSS ENTIRE SUBSTATION.
21. NEW GROUTED RIPRAP. SEE RIPRAP NOTES, C01, DWG 0398-138-43-0001. FOR DIMENSIONS, SEE DETAIL **F**, C04, DWG 0398-138-04-0002.
22. NEW CONCRETE DRAINAGE SWALE.
23. NEW MULTI-USE PATH CROSSING. SEE DETAIL **G**, C04, DWG 0398-138-04-0002.
24. FUTURE MULTI-USE PATH TO BE CONSTRUCTED PER CITY OF TUCSON PROP 407 PROGRAM. SHOWN FOR SCHEMATIC PURPOSES ONLY.
25. NEW DAVIS MONTHAN AIR FORCE BASE SECURITY FENCE PER SEPARATE PLANS AND PERMIT.
26. EXISTING FENCE TO BE REMOVED BY OTHERS.
27. NEW THICKENED PAVEMENT EDGE. SEE DETAIL **H**, C04, DWG 0398-138-04-0002.
28. NEW VEHICULAR ACCESS GATE, MANUAL (ROLLING). OWNER TO PROVIDE DETAILS/FINISHES.
29. NEW 8' POLE FOUNDATION TO BE PROTECTED WITH RAISED GRADE AND 1' WIDE GROUTED RIPRAP. SEE RIPRAP NOTES, C01, DWG 0398-138-43-0001.

Registered Professional Engineer (Civil)
CERTIFICATE NO.
37624
KEVIN M. HALL
Date Signed 04.29.2021
ARIZONA, U.S.A.

SCALE AS NOTED
APRIL 2021

CYPRESS CIVIL
2030 east speedway boulevard
suite #110
tucson, arizona 85719
ph: 520.499.2456
e: info@cypresscivil.com
CYPRESS CIVIL PROJECT NO: 20.116

SITE PLAN DEVELOPMENT PACKAGE

FOR

TEP PATRIOT SUBSTATION

PARCEL TBD
LOCATED IN NE 1/4 OF SECTION 31, T 14 S, R 15 E, G&SRM,
CITY OF TUCSON, PIMA COUNTY, ARIZONA

DP ___

REF: T21SE00006
COT ADMINISTRATIVE ADDRESS:
6980 EAST ESCALANTE ROAD
TUCSON, ARIZONA 85707

SHEET 3 OF 17

REVISIONS

DATE	ENG	TECH	REV
04/29/2021	J MARTINEZ	CYPRESS CIVIL	00

DESCRIPTION:
ISSUED FOR CONSTRUCTION
PATRIOT SUBSTATION DEVELOPMENT PLAN
JOB NO. 10449.00 / WO 6297641

VENDOR

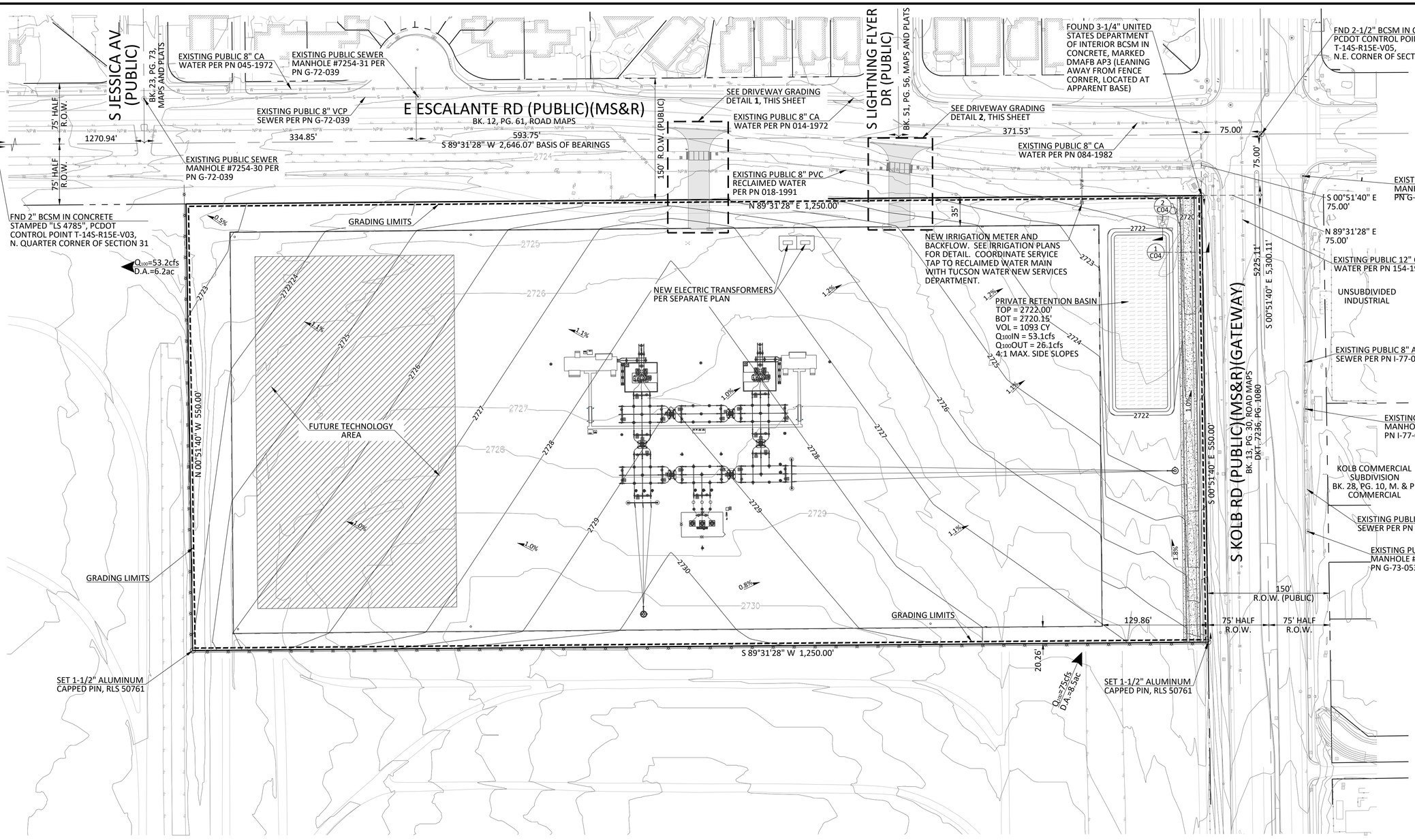
NAME: | DRAWING #: | SHOP ORDER #: | TEP PO #:

AUTOCADD

Tucson Electric Power Company
TUCSON, ARIZONA

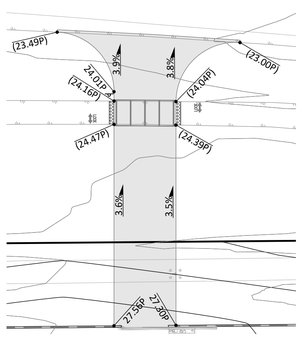
TITLE: SITE DEVELOPMENT
DEVELOPMENT PLAN
PATRIOT SUBSTATION

TRSQ T14S,15E,S31
REF # N/A
DWG # 0398-138-04-0004
REV 00
SHEET C02

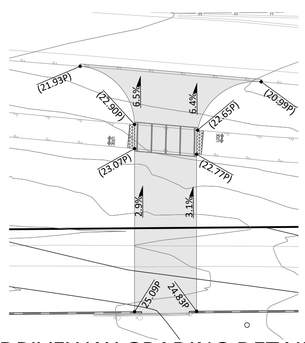


NOTE

FOR SHEET C04 CROSS SECTIONS, SEE DWG 0398-138-05-0002



1 DRIVEWAY GRADING DETAIL
SCALE: 1"=30'



2 DRIVEWAY GRADING DETAIL
SCALE: 1"=30'

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811
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Registered Professional Engineer (Civil)
CERTIFICATE NO.
37624
KEVIN M. HALL
Date Signed 04.29.2021
ARIZONA, U.S.A.

SCALE AS NOTED
APRIL 2021

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CYPRESS CIVIL PROJECT NO: 20.116

GRADING + UTILITY PLAN DEVELOPMENT PACKAGE

FOR

TEP PATRIOT SUBSTATION

PARCEL TBD
LOCATED IN NE 1/4 OF SECTION 31, T 14 S, R 15 E, G&SRM,
CITY OF TUCSON, PIMA COUNTY, ARIZONA

DP ___

REF: T21SE00006
COT ADMINISTRATIVE ADDRESS:
6980 EAST ESCALANTE ROAD
TUCSON, ARIZONA 85707

SHEET 4 OF 17

REVISIONS

DATE	ENG	TECH	REV
04/29/2021	J MARTINEZ	CYPRESS CIVIL	00

DESCRIPTION:
ISSUED FOR CONSTRUCTION
PATRIOT SUBSTATION DEVELOPMENT PLAN
JOB NO. 10449.00 / WO 6297641

VENDOR

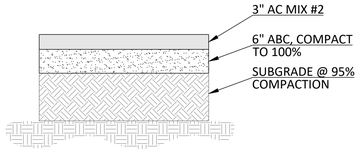
NAME: DRAWING #: SHOP ORDER #: TEP PO #:

AUTOCADD

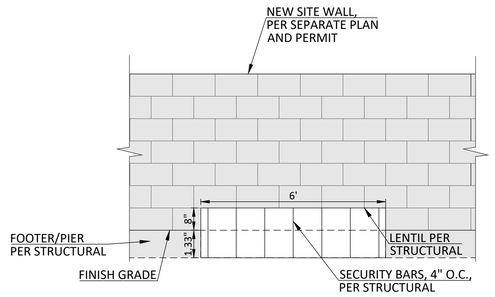
Tucson Electric Power Company
TUCSON, ARIZONA

TITLE: SITE GRADING AND STRUCTURAL GRADING PLAN PATRIOT SUBSTATION

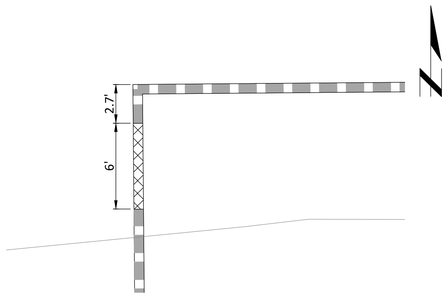
TR/SQ T14S,15E,S31
REF # N/A
DWG # 0398-138-05-0001
REV 00
SHEET C03



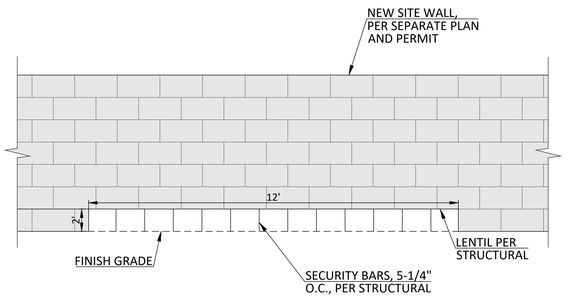
A TYPICAL PAVEMENT SECTION
SCALE: 1"=1'



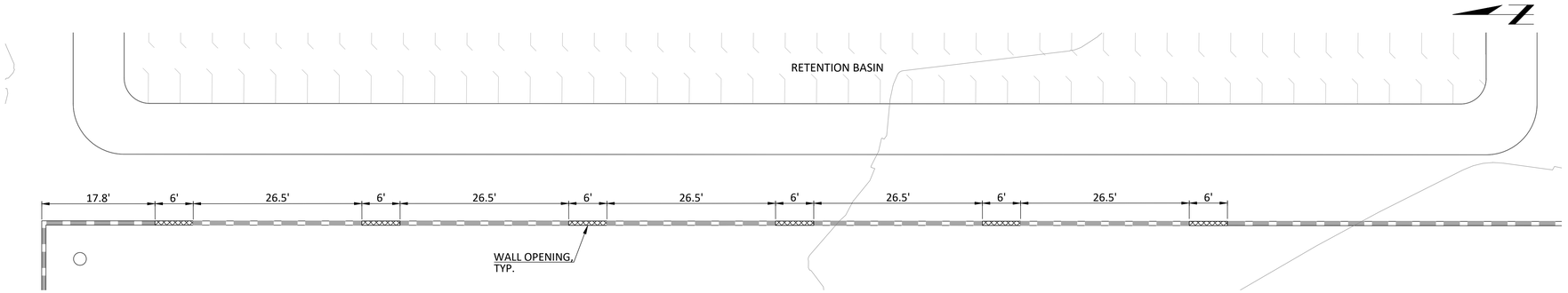
B WALL OPENING DETAIL
N.T.S.



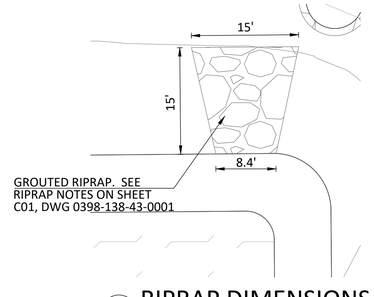
C WALL OPENING LOCATION
SCALE: 1:5



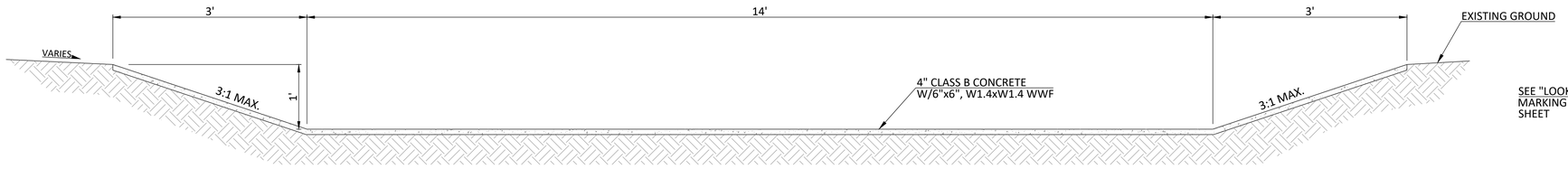
D WALL OPENING DETAIL
N.T.S.



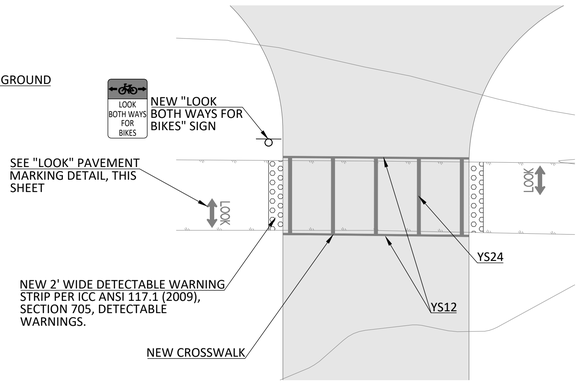
E WALL OPENING LOCATIONS
SCALE: 1":10'



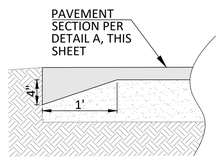
F RIPRAP DIMENSIONS
SCALE: 1"=10'



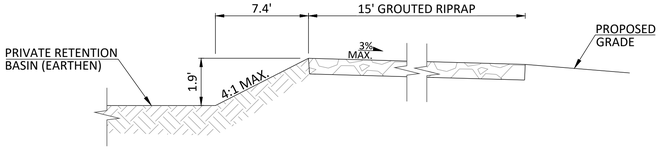
1 CONCRETE DRAINAGE SWALE CROSS SECTION
SCALE: 1":1'



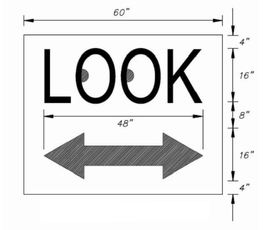
G MULTI-USE PATH CROSSING
SCALE: 1"=10'



H THICKENED EDGE
N.T.S.



2 DRAINAGE OUTLET DETAIL
SCALE: N.T.S.



"LOOK" PAVEMENT MARKING
SCALE: N.T.S.

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811
Call 811 or click Arizona811.com

Registered Professional Engineer (Civil) CERTIFICATE NO. 37624 KEVIN M. HALL Date Signed 04-29-2021 ARIZONA, U.S.A.

SCALE AS NOTED
APRIL 2021

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tucson, arizona 85719
ph: 520.499.2456
e: info@cypresscivil.com
CYPRESS CIVIL PROJECT NO: 20.116

DETAILS AND SECTIONS DEVELOPMENT PACKAGE

FOR

TEP PATRIOT SUBSTATION

PARCEL TBD
LOCATED IN NE 1/4 OF SECTION 31, T 14 S, R 15 E, G&SRM,
CITY OF TUCSON, PIMA COUNTY, ARIZONA

DP ___

REF: T21SE00006
COT ADMINISTRATIVE ADDRESS:
6980 EAST ESCALANTE ROAD
TUCSON, ARIZONA 85707

SHEET 5 OF 17

REVISIONS

DATE	ENG	TECH	REV
04/29/2021	J MARTINEZ	CYPRESS CIVIL	00

DESCRIPTION:
ISSUED FOR CONSTRUCTION
PATRIOT SUBSTATION DEVELOPMENT PLAN
JOB NO. 10449.00 / WO 6297641

VENDOR

NAME: DRAWING #: SHOP ORDER #: TEP PO #:

AUTOCADD

Tucson Electric Power Company
TUCSON, ARIZONA

TITLE: SITE GRADING AND STRUCTURAL
GRADING DETAILS
PATRIOT SUBSTATION

TRSQ T14S,15E,S31
REF # N/A
DWG # 0398-138-05-0002
REV 00
SHEET C04

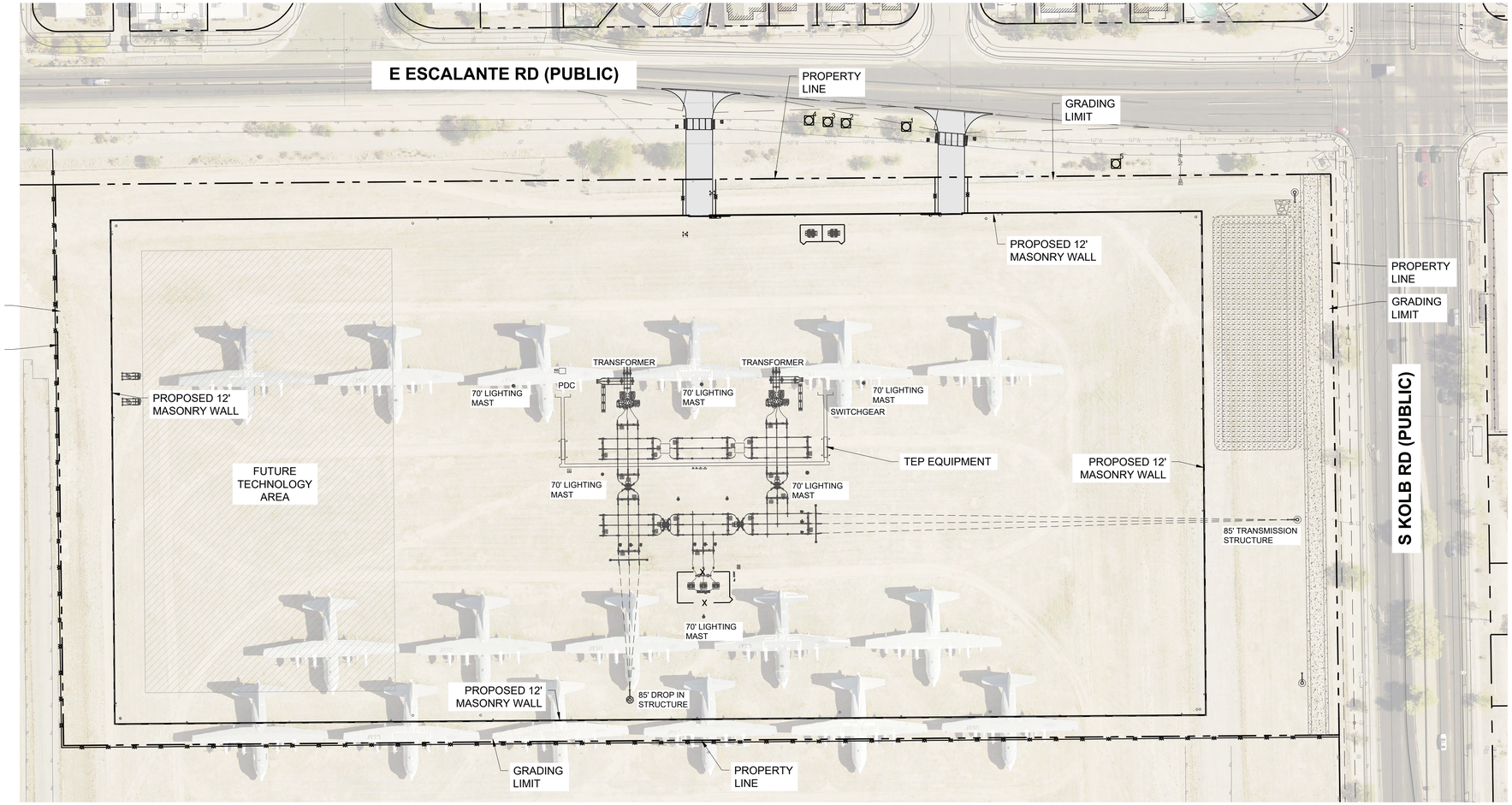

IMAGE 1 - LOOKING SOUTH

IMAGE 2 - LOOKING SOUTHEAST

IMAGE 3 - LOOKING SOUTH

IMAGE 4 - LOOKING SOUTHEAST

IMAGE 5 - LOOKING SOUTH

IMAGE 6 - LOOKING SOUTHEAST

Contact Arizona 811 at least two full working days before you begin excavation
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Refer to specifications for additional information on policies, performances, and products.

ENVIRONMENTAL RESOURCE REPORT OVERVIEW:

The project site is an existing aircraft storage facility that has been cleared with little to no vegetation on site. This site is located southwest corner of Kolb Rd and Escalante Rd. The plant inventory methodology has been used for this plan, refer to this sheets.

This site contains no xeroriparian habitat over the 15.78 acres. Upon conducting site reviews and analyzing data, no vegetation. No significant site amenities or features are identified on site. No federally protected plant material were found on site.

A few trees planted along East Escalante Road may be impacted with the proposed access drives to the site. These trees have been lifted and lion-tailed impacting their overall health and development. Below is a summary of our findings.

ENVIRONMENTAL RESOURCE REPORT:

1. Minor Encroachment Modification - a full report is not applicable to this project area.
   a. Refer to the development package and these plans for applicable information to a minor environmental resource report.
   b. No 100-year floodplain limits are identified within project site.
   c. Soil conditions as defined within this site as classified by the United States Soil Conservation Service (SCS) as 100% hydrologic soil group "C".
   d. Existing rights of way are identified within development package. There are no drainage easements identified on site.
   e. Proposed drainage swale and private retention basin on site.
   f. Refer to development package and associated drainage statement.
   g. Groundwater recharge - not proposed and not likely due to intended site use and natural conflicts with said use. Passive water harvesting is proposed in landscape areas.
   h. No sediment transport should occur with the proposed drainage scheme. Refer to the drainage statement and development package submittal.
   i. All existing and proposed utilities are referenced within the plan set.
   j. None present.
   k. Refer to plan on this sheet.
   l. Refer to plan on this sheet, aerial Spring 2019.
   m. Ground images taken Thursday February 18, 2021.
   n. Basin management, refer to civil plans of the development package for the proposed water harvesting basins.
   o. None found on site.
   p. None found on site.
   q. Multi-use trail found along north side of the site within East. Escalante road.
   r. No vegetation found within the proposed site improvements. Vegetation that may be impacted along E. Escalante Road identified within the summary noted on this plan.
   s. Not Applicable to this minor report.
   t. Not Applicable to this minor report.
   u. No impact or encroachment to mapped riparian areas.
   v. Not applicable.
   w. Not applicable.
   x. Refer to proposed re-vegetation and restoration proposed within the street borders of the proposed improvements plans.
2. Development Restrictions: none applicable to the proposed project.

Number	Scientific Name	Common Name	Size - Caliper	Size - Height	Arms	Viability	Transplantability	Comments	Disposition
1	Parkinsonia florida	Blue Paloverde	12"	18'	-	M	L	pd	PIP
2	Parkinsonia florida	Blue Paloverde	10"	18'	-	M	M	pd	PIP
3	Parkinsonia florida	Blue Paloverde	6"	18'	-	M	M	pd	PIP
4	Parkinsonia florida	Blue Paloverde	8"	18'	-	M	M	pd	PIP
5	Parkinsonia florida	Blue Paloverde	14"	18'	-	M	M	pd	PIP

SITE CALCULATIONS:

Total site area:	687,342.54 sf (15.78 acres)
Xeroriparian area:	0.00 sf (0.00 acres)
Proposed riparian area disturbed:	0.00 sf (0.00 acres)

NPPO LEGEND
- Preserve in place (PIP)
- Blue Palo Verde
- Existing shrubs

REGISTERED LANDSCAPE ARCHITECT
CERTIFICATE NO.
39813
ERIC R. BARRETT
04/21
Date Signed
ARIZONA U.S.A.
EXPIRES 9/30/2021

SCALE AS NOTED
APRIL 2021

ARC STUDIOS
3117 E. Flower Steet
Tucson, Arizona 85716
phone: 520.882.9655
www.arcstudiosinc.com
landscape architecture . urban design
environmental services . irrigation design

ARC STUDIOS PROJECT NO: 01-20078

NATIVE PLANT PRESERVATION DEVELOPMENT PACKAGE

FOR

TEP PATRIOT SUBSTATION

PARCEL TBD
LOCATED IN NE 1/4 OF SECTION 31, T 14 S, R 15 E, G&SRM,
CITY OF TUCSON, PIMA COUNTY, ARIZONA

DP ___

REF: T21SE00006
COT ADMINISTRATIVE ADDRESS:
6980 EAST ESCALANTE ROAD
TUCSON, ARIZONA 85707

REVISIONS

DATE	ENG	TECH	REV

DESCRIPTION:
ISSUED FOR CONSTRUCTION
PAT SUB DEV PLAN
JOB No. 10449.00 / WO 6297641

TUCSON ELECTRIC POWER
3950 E IRVINGTON RD.
TUCSON, AZ 85714
ATTN: JESUS MARTINEZ
520-396-2551

VENDOR

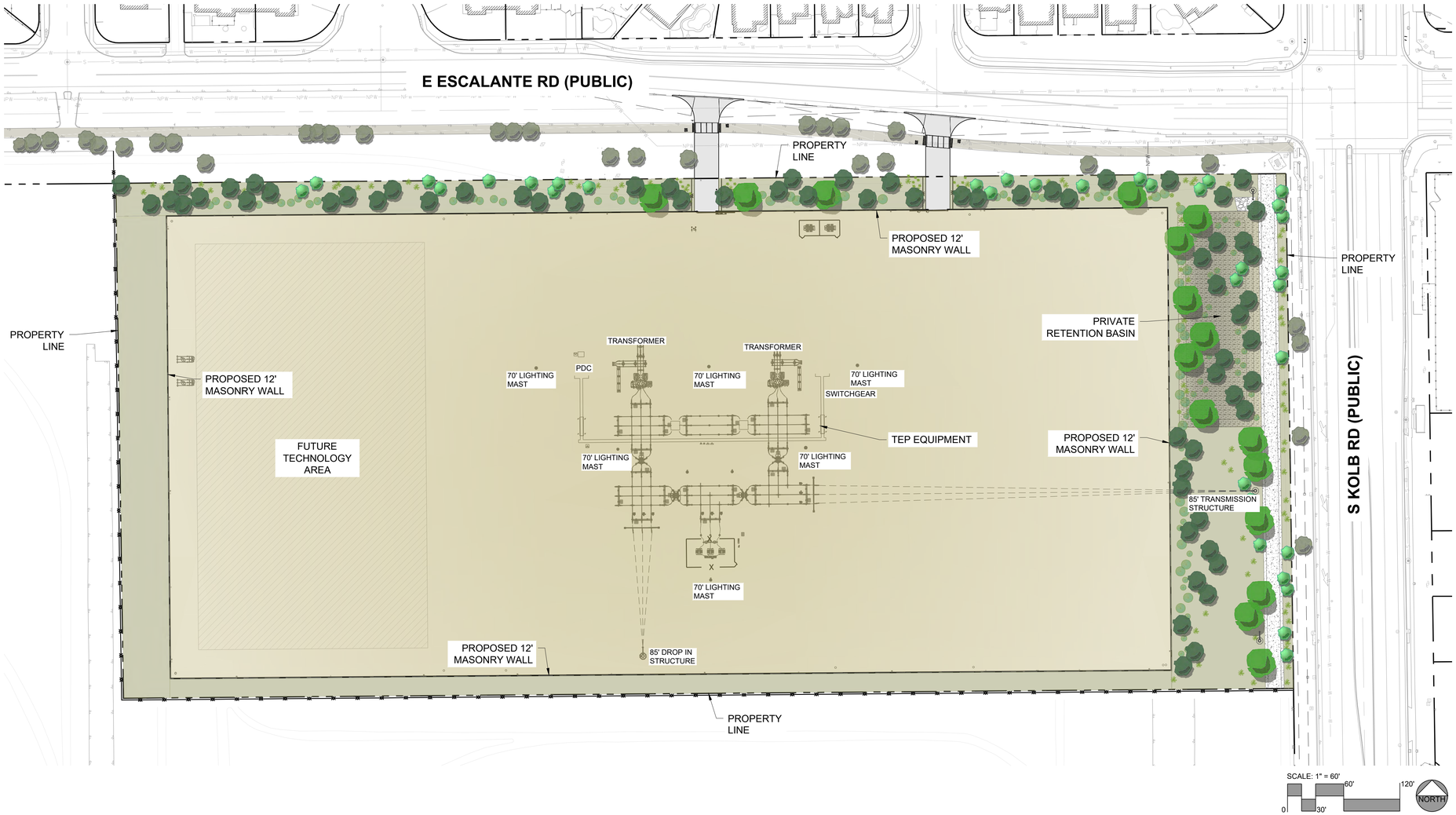
NAME: DRAWING #: SHOP ORDER #: TEP PO #:

AUTOCADD

Tucson Electric Power Company
TUCSON, ARIZONA

TITLE: SITE DEVELOPMENT
NATIVE PLANT PRESERVATION
PATRIOT SUBSTATION

TRSQ T14S,15E,S31
REF # N/A
DWG # 0398-138-04-0005
REV 00
SHEET C05



LANDSCAPE CONCEPT LEGEND

Trees

- Large native riparian shade tree
- Medium native/ drought tolerant shade
- Small native/ drought tolerant tree
- Existing tree to remain

Shrubs / Succulents

- Large native screening plant
- Medium native screening plant
- Large native accent
- Medium native accent
- Small native accent

Ground Cover Treatment

- Hydro-seed - desert restoration

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Refer to specifications for additional information on policies, performances, and products.

REGISTERED LANDSCAPE ARCHITECT
CERTIFICATE NO.
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LANDSCAPE PLAN DEVELOPMENT PACKAGE

FOR

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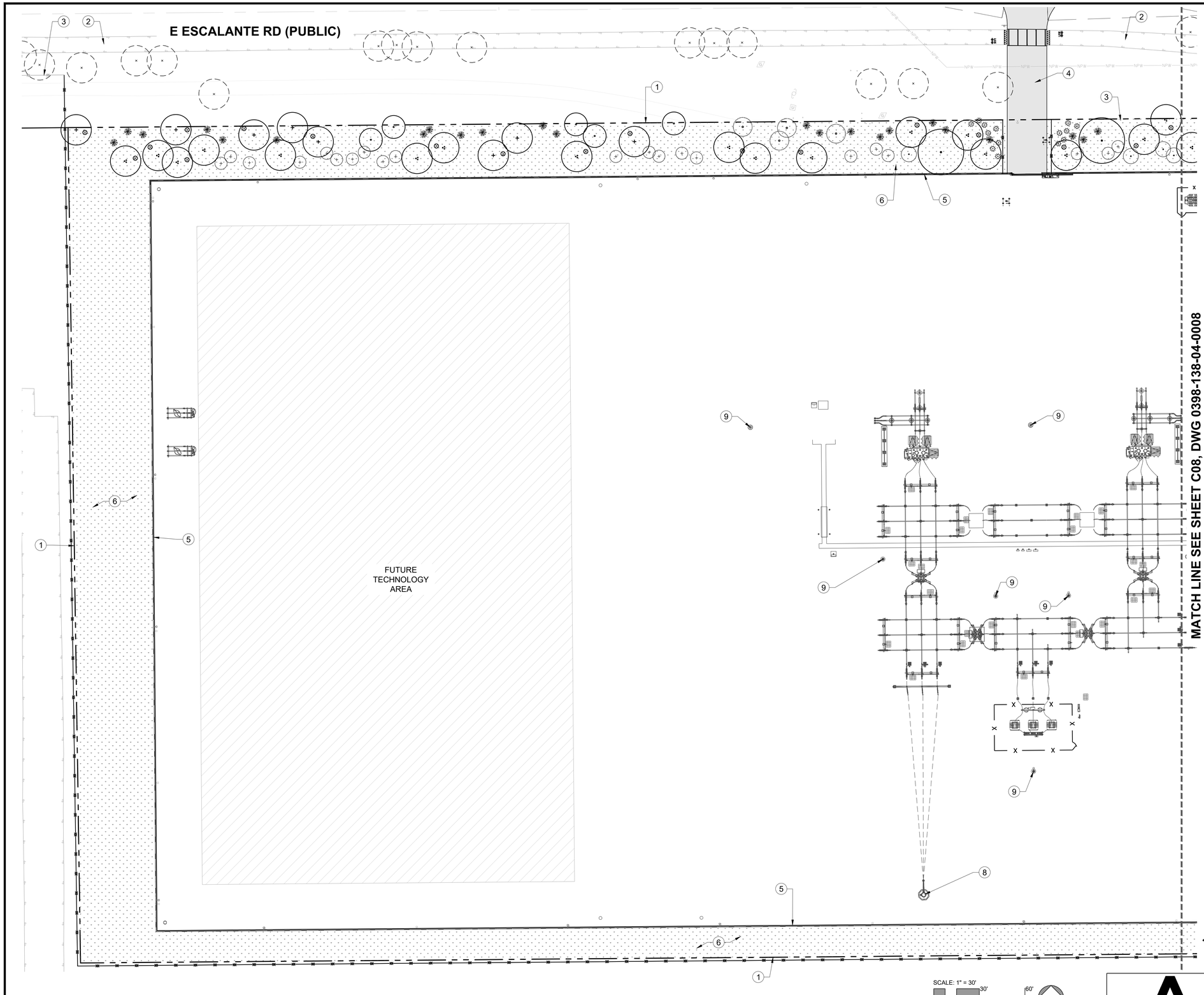
Tucson Electric Power Company
TUCSON, ARIZONA

TITLE: SITE DEVELOPMENT
LANDSCAPE PLAN
PATRIOT SUBSTATION

TRSQ	T14S,15E,S31
REF #	N/A
DWG #	0398-138-04-0006
REV	00
SHEET	C06



LANDSCAPE LEGEND

Furnish and install landscape material per plans, details and specifications. All plant material to meet ANA specifications and be of sound health and appearance.

Trees	Size	Qty
Prosopis glandulosa *honey mesquite*	24" box multi	42
Parkinsonia florida *blue paloverde*	24" box multi	13
Chilopsis linearis 'Bubba' *semi-seedless desert willow*	24" box multi	11
Celtis reticulata *netleaf hackberry*	24" box standard	16
Gossypium thurberi *desert cotton*	15 gallon multi	17
Eysenhardtia orthocarpa *kidneywood*	15 gallon multi	17
Existing tree to remain in place		

Shrubs / Ground Covers	Size	Qty
Vauquelinia californica *arizona rosewood*	5 gallon	30
Dodonea viscosa *hop seed*	5 gallon	26
Lycium andersonii *wolfberry*	5 gallon	25
Acacia greggii *catclaw acacia*	5 gallon	15
Cacti / Succulents	**Size**	**Qty**
Yucca elata *soaptree yucca*	5 gallon	80
Euphorbia antisyphilitica *candelilla*	5 gallon	28
Carnegiea gigantea *saguaro*	4' spear	41

Hydro-seed - mix 1

24 lbs pure live seed - refer to specs.

hydro seed mix - 1

Botanical Name	Common Name	lbs/ac
Encelia farinosa	*brittlebush*	0.5
Ambrosia deltoidea	*triangle-leaf bursage*	4.5
Acacia constricta	*whitethorn acacia*	1.0
Prosopis velutina	*velvet mesquite*	0.5
Cecidium micriphyllum	*foothills palo verde*	1.0
Baileya multiradiata	*desert marigold*	1.0
Cassia covesii	*desert senna*	2.0
Eschscholzia mexicana	*mexican gold poppy*	1.5
Lupinus succulentus	*lupine*	2.0
Penstemon parryi	*parry penstemon*	1.5
Phacelia campanularia	*desert bluebells*	2.0

Hydro-seed - mix 2

12 lbs pure live seed - refer to specs.

hydro seed mix - 2

Botanical Name	Common Name	lbs/ac
Bouteloua dactyloides	buffalo grass	4.0
Hilaria belangeri	Curly mesquite	4.0
Hilara mutica	Tobosa grass	4.0

LANDSCAPE KEY NOTES

1. Property line
2. Existing multi-use asphalt path
3. Existing fence
4. Pavement - refer to civil
5. 12' masonry screen wall - refer to civil
6. Desert seed - hydro-seed mix 1
7. Desert seed - hydro-seed mix 2
8. 85' drop-in transmission structure
9. 70' lightning mast

SCALE: 1" = 30'

0 15' 30' 60' NORTH

REGISTERED LANDSCAPE ARCHITECT CERTIFICATE NO. 39813 ERIC R. BARRETT 04/21 Date Signed ARIZONA U.S.A.

EXPIRES 9/30/2021

SCALE AS NOTED
APRIL 2021

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ARC STUDIOS PROJECT NO: 01-20078

LANDSCAPE PLAN DEVELOPMENT PACKAGE

FOR

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DP ___

REF: T21SE00006
COT ADMINISTRATIVE ADDRESS:
6980 EAST ESCALANTE ROAD
TUCSON, ARIZONA 85707

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811
Call 811 or click Arizona811.com

Refer to specifications for additional information on policies, performances, and products.

REVISIONS

DATE	ENG	TECH	REV

DESCRIPTION:
ISSUED FOR CONSTRUCTION
PAT SUB DEV PLAN
JOB No. 10449.00 / WO 6297641

TUCSON ELECTRIC POWER
3950 E IRVINGTON RD.
TUCSON, AZ 85714
ATTN: JESUS MARTINEZ
520-396-2551

VENDOR

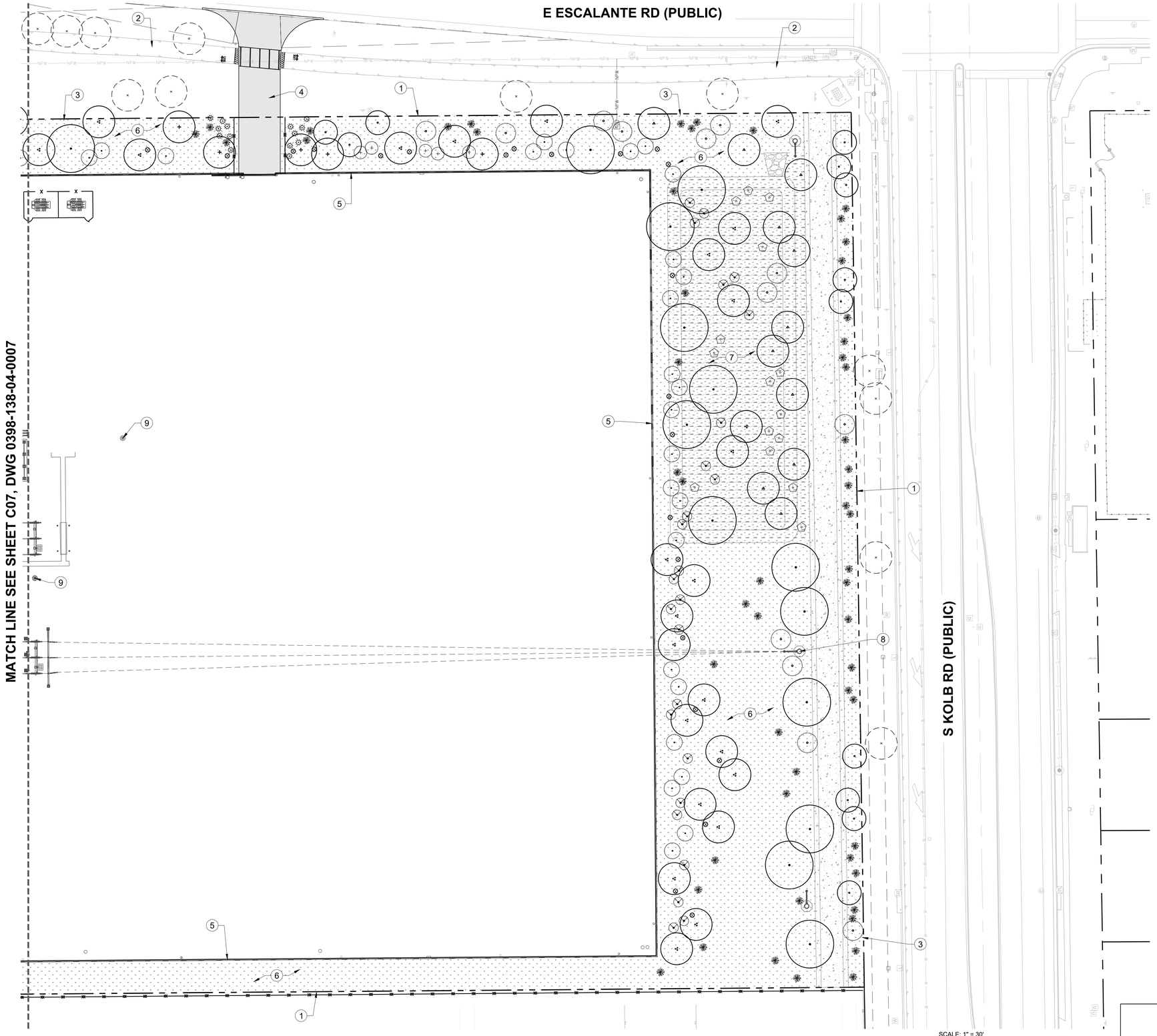
NAME: DRAWING #: SHOP ORDER #: TEP RO #:

AUTOCADD

Tucson Electric Power Company
TUCSON, ARIZONA

TITLE: SITE DEVELOPMENT
LANDSCAPE PLAN
PATRIOT SUBSTATION

TRSQ	T14S,15E,S31
REF #	N/A
DWG #	0398-138-04-0007
REV	00
SHEET	C07



LANDSCAPE LEGEND

Furnish and install landscape material per plans, details and specifications. All plant material to meet ANA specifications and be of sound health and appearance.

Trees	Size	Qty
Prosopis glandulosa *honey mesquite*	24" box multi	42
Parkinsonia florida *blue paloverde*	24" box multi	13
Chilopsis linearis 'Bubba' *semi-seedless desert willow*	24" box multi	11
Celtis reticulata *netleaf hackberry*	24" box standard	16
Gossypium thurberi *desert cotton*	15 gallon multi	17
Eysenhardtia orthocarpa *kidneywood*	15 gallon multi	17
Existing tree to remain in place		

Shrubs / Ground Covers	Size	Qty
Vauquelinia californica *arizona rosewood*	5 gallon	30
Dodonea viscosa *hop seed*	5 gallon	26
Lycium andersonii *wolfberry*	5 gallon	25
Acacia greggii *catclaw acacia*	5 gallon	15
Cacti / Succulents	**Size**	**Qty**
Yucca elata *soaptree yucca*	5 gallon	80
Euphorbia antisyphilitica *candelilla*	5 gallon	28
Carnegiea gigantea *saguaro*	4' spear	41

Hydro-seed - mix 1

24 lbs pure live seed - refer to specs.

hydro seed mix - 1

Botanical Name	Common Name	lbs/ac
Encelia farinosa	*brittlebush*	0.5
Ambrosia deltoidea	*triangle-leaf bursage*	4.5
Acacia constricta	*whitethorn acacia*	1.0
Prosopis velutina	*velvet mesquite*	0.5
Cecidium micriphyllum	*foothills palo verde*	1.0
Baileya multiradiata	*desert marigold*	1.0
Cassia covesii	*desert senna*	2.0
Eschscholzia mexicana	*mexican gold poppy*	1.5
Lupinus succulentus	*lupine*	2.0
Penstemon parryi	*parry penstemon*	1.5
Phacelia campanularia	*desert bluebells*	2.0

Hydro-seed - mix 2

12 lbs pure live seed - refer to specs.

hydro seed mix - 2

Botanical Name	Common Name	lbs/ac
Bouteloua dactyloides	buffalo grass	4.0
Hilaria belangeri	Curly mesquite	4.0
Hilara mutica	Tobosa grass	4.0

(#) LANDSCAPE KEY NOTES

1. Property line
2. Existing multi-use asphalt path
3. Existing fence
4. Pavement - refer to civil
5. 12' masonry screen wall - refer to civil
6. Desert seed - hydro-seed mix 1
7. Desert seed - hydro-seed mix 2
8. 85' drop-in transmission structure
9. 70' lightning mast

REGISTERED LANDSCAPE ARCHITECT
CERTIFICATE NO.
39813
ERIC R.
BARRETT
04/21
Date Signed
ARIZONA U.S.A.

EXPIRES 9/30/2021

SCALE AS NOTED
APRIL 2021

ARC STUDIOS
3117 E. Flower Street
Tucson, Arizona 85716
phone: 520.882.9655
www.arcstudiosinc.com
landscape architecture . urban design
environmental services . irrigation design

ARC STUDIOS PROJECT NO: 01-20078

LANDSCAPE PLAN DEVELOPMENT PACKAGE

FOR

TEP PATRIOT SUBSTATION

PARCEL TBD
LOCATED IN NE 1/4 OF SECTION 31, T 14 S, R 15 E, G&SRM,
CITY OF TUCSON, PIMA COUNTY, ARIZONA

DP ___

REF: T21SE00006
COT ADMINISTRATIVE ADDRESS:
6980 EAST ESCALANTE ROAD
TUCSON, ARIZONA 85707

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REVISIONS

DATE	ENG	TECH	REV

DESCRIPTION:
ISSUED FOR CONSTRUCTION
PAT SUB DEV PLAN
JOB No. 10449.00 / WO 6297641

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3950 E IRVINGTON RD.
TUCSON, AZ 85714
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520-396-2551

VENDOR

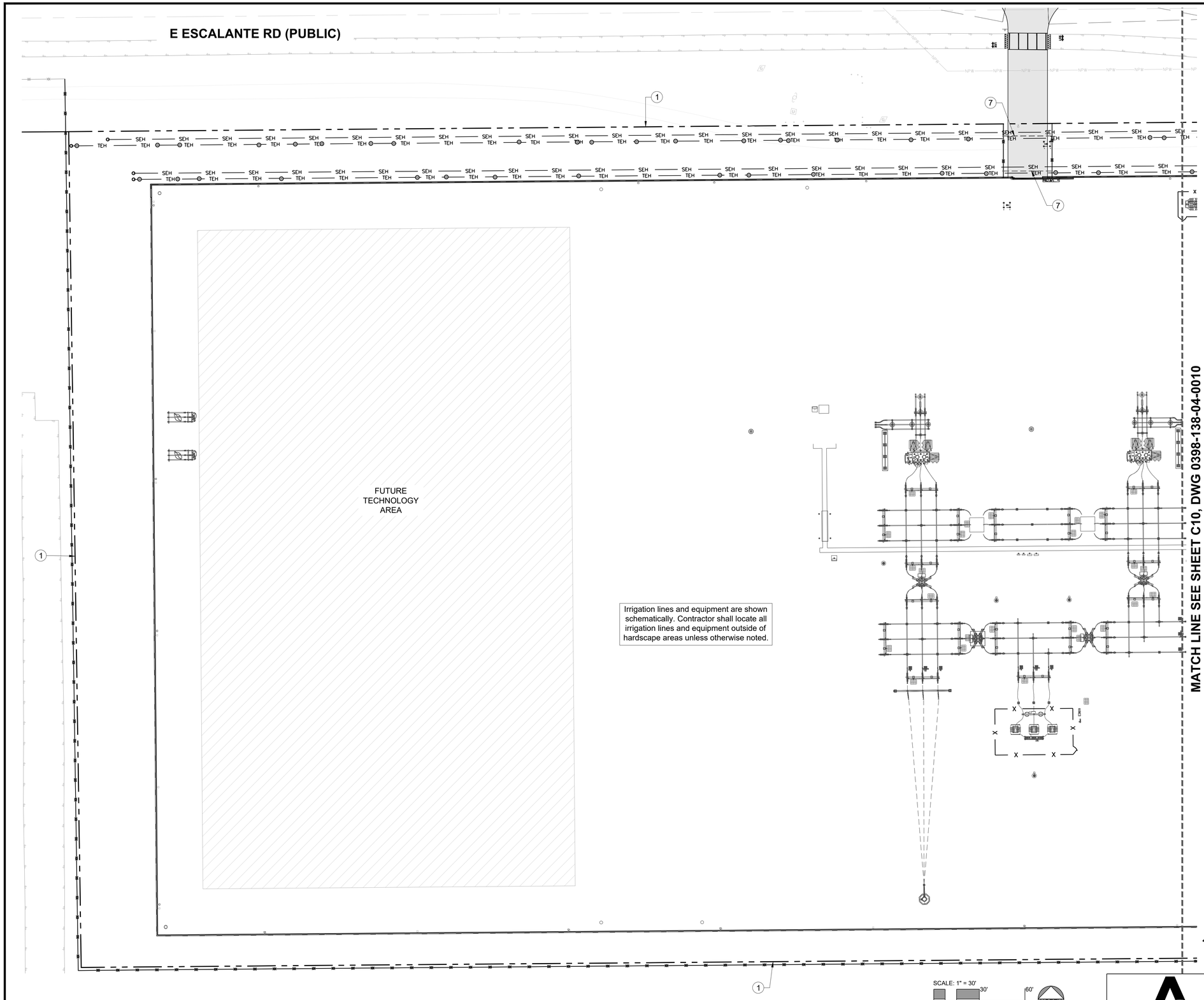
MARK: DRAWING #: SHOP ORDER #: TEP PO #:

AUTOCADD

TEP Tucson Electric Power Company
TUCSON, ARIZONA

TITLE: SITE DEVELOPMENT
LANDSCAPE PLAN
PATRIOT SUBSTATION

TRSQ T14S,15E,S31
REF # N/A
DWG # 0398-138-04-0008
REV 00
SHEET C08



IRRIGATION LEGEND

furnish and install all material per plans, details, and specifications

- [S] irrigation source / point of connection - tap into existing reclaimed mainline
- Z auto flush filter - amiad saf series 1500 or approved equal w/ enclosure
- irrigation mainline - sch. 40 pvc 1-1/2" w/ sch. 80 fittings, 2hr pressure test at 150 psi2-wire - 1-1/4" min. ul sch. 40 pvc gray elec. w/ pull boxes tw-cad-14, tw-splice-14, tw-la-1(s) per 500 linear foot
- [A] irrigation controller - rain master eagle; egp-tw-s - 2-wire, 16 station min.
- (MV) master valve and flow sensor: master valve - superior 3100 n.o. - 1"; flow sensor - cst fsi-t series - 1", ev-cab-sen
- (IV) isolation valve - 1-1/2" lead free brass ball valve
- remote control valve - irritrol 700 series, 700-1 with tw-d 1-4 as required.
- irrigation sleeve - class 200 pvc - 4" mainlines and multiple lines 2" single line and controller wiring
- —TEH— tree line - sch. 40 pvc - 3/4" unless otherwise shown
- —SEH— shrub line - sch. 40 pvc - 3/4" unless otherwise shown
- hose end cap
- pressure regulating filter - rain bird - prb-qkchk-100
- multi-outlet xeri-bug emitters rain bird - (6) 1gph and 2 gph ports - refer to emitter schedule
- NOT SHOWN single-port emitters - install rain bird xeri-bug xbt-10 and xbt-20 - refer to emitter schedule

IRRIGATION VALVE SCHEDULE

Valve	Size	Type			
A-1	1"	shrub	A-5	1"	tree
A-2	1"	tree	A-6	1"	shrub
A-3	1"	shrub	A-7	1"	tree
A-4	1"	tree	A-8	1"	shrub

VALVE SCHEDULE NOTES:

1. (M) multi-port emitter, (s) single-port emitter. Contractor may select to provide multi-port emitters for shrub plant material.
2. Contractor shall adjust controller for the proposed emitter schedule and provide watering to promote healthy growth of plant material for establishment.

EMITTER SCHEDULE

Trees	Type	Outlets	Gph outlet	Gph plant
Prosopis glandulosa *honey mesquite*	m	5	2.0	10.0
Parkinsonia florida *blue paloverde*	m	5	2.0	10.0
Chilopsis linearis 'Bubba' *semi-seedless desert willow*	m	5	2.0	10.0
Celtis reticulata *netleaf hackberry*	m	6	2.0	12.0
Gossypium thurberi *desert cotton*	m	4	2.0	8.0
Eysenhardtia orthocarpa *kidneywood*	m	4	2.0	8.0
Shrubs / Ground Covers	**Type**	**Outlets**	**Gph outlet**	**Gph plant**
Vauquelinia californica *arizona rosewood*	s/m	3	2.0	6.0
Dodonea viscosa *hop seed*	s/m	2	2.0	4.0
Lycium andersonii *wolfberry*	s/m	2	2.0	4.0
Acacia greggii *catclaw acacia*	s/m	2	1.0	2.0
Cacti / Succulents	**Type**	**Outlets**	**Gph outlet**	**Gph plant**
Yucca elata *soaptree yucca*	s/m	1	0.5	0.5
Euphorbia antisyphilitica *candelilla*	s/m	1	1.0	1.0
Carnegiea gigantea *saguaro*	s/m	0	0.0	0.0

(#) IRRIGATION KEY NOTES

1. Property line
2. Irrigation source
3. Irrigation mainline
4. Backflow preventer
5. Master valve and flow sensor
6. Isolation valve
7. Irrigation sleeve - refer to paving & grading plans
8. Irrigation controller

REGISTERED LANDSCAPE ARCHITECT CERTIFICATE NO. 39813 ERIC R. BARRETT 04/21 Date Signed ARIZONA U.S.A.

EXPIRES 9/30/2021

SCALE AS NOTED
APRIL 2021

IRRIGATION PLAN DEVELOPMENT PACKAGE

FOR

TEP PATRIOT SUBSTATION

PARCEL TBD
LOCATED IN NE 1/4 OF SECTION 31, T 14 S, R 15 E, G&SRM,
CITY OF TUCSON, PIMA COUNTY, ARIZONA

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JOB No. 10449.00 / WO 6297641

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VENDOR

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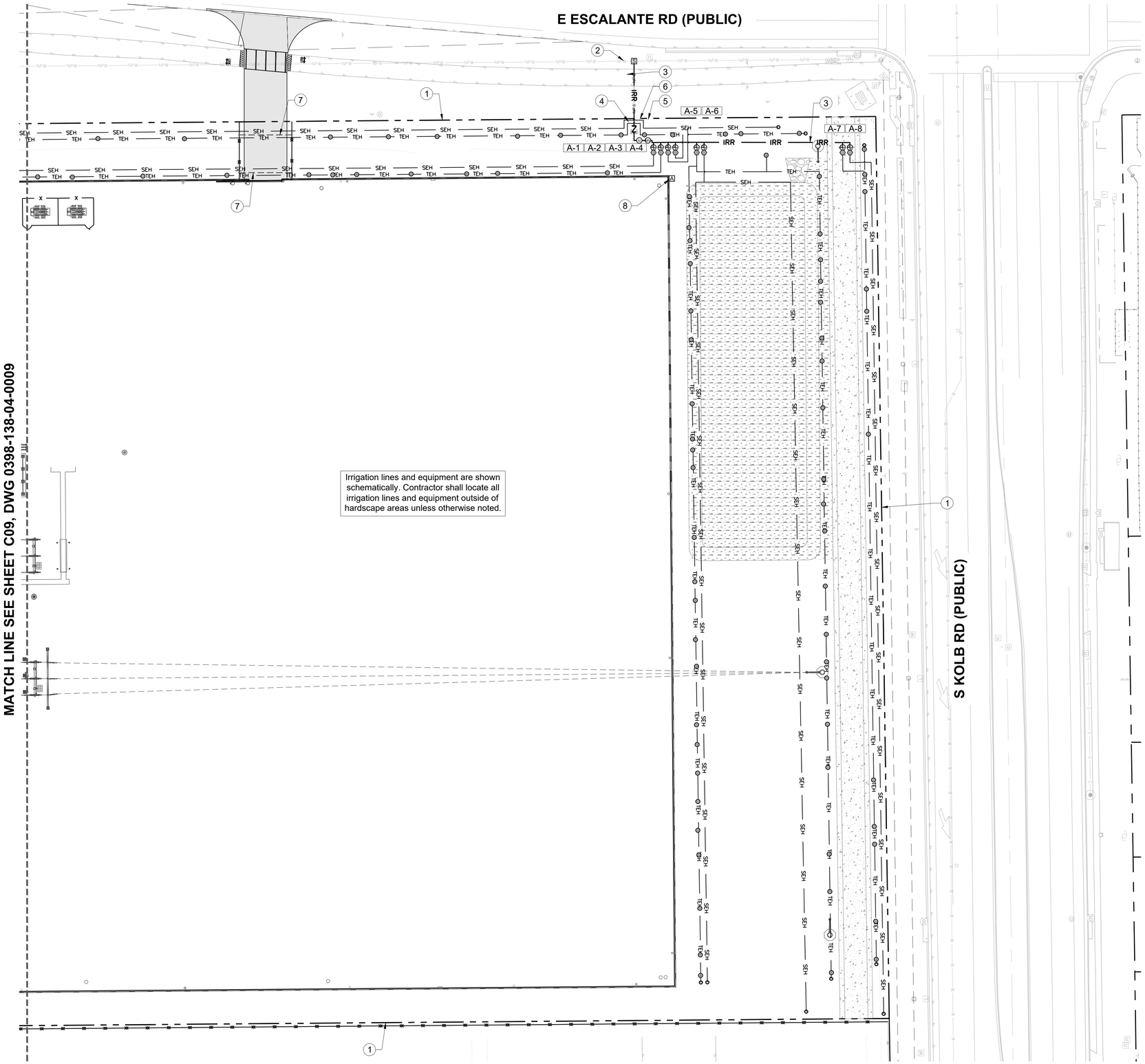
AUTOCADD

Tucson Electric Power Company
TUCSON, ARIZONA

TITLE: SITE DEVELOPMENT
IRRIGATION PLAN
PATRIOT SUBSTATION

TRSQ T14S,15E,S31
REF # N/A
DWG # 0398-138-04-0009
REV 00 SHEET C09



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Acacia greggii *catclaw acacia*	s/m	2	1.0	2.0
Cacti / Succulents	**Type**	**Outlets**	**Gph outlet**	**Gph plant**
Yucca elata *soaptree yucca*	s/m	1	0.5	0.5
Euphorbia antisyphilitica *candelilla*	s/m	1	1.0	1.0
Carnegiea gigantea *saguaro*	s/m	0	0.0	0.0

(#) IRRIGATION KEY NOTES

1. Property line
2. Irrigation source
3. Irrigation mainline
4. Backflow preventer
5. Master valve and flow sensor
6. Isolation valve
7. Irrigation sleeve - refer to paving & grading plans
8. Irrigation controller

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CERTIFICATE NO.
39813
ERIC R. BARRETT
04/21
Date Signed
ARIZONA, U.S.A.

EXPIRES 9/30/2021

SCALE AS NOTED
APRIL 2021

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environmental services . irrigation design

ARC STUDIOS PROJECT NO: 01-20078

IRRIGATION PLAN DEVELOPMENT PACKAGE

FOR

TEP PATRIOT SUBSTATION

PARCEL TBD
LOCATED IN NE 1/4 OF SECTION 31, T 14 S, R 15 E, G&SRM,
CITY OF TUCSON, PIMA COUNTY, ARIZONA

DP ___

REF: T21SE00006
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TUCSON, ARIZONA 85707

REVISIONS

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JOB No. 10449.00 / WO 6297641

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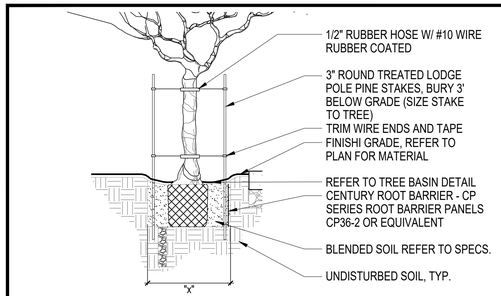
AUTOCADD

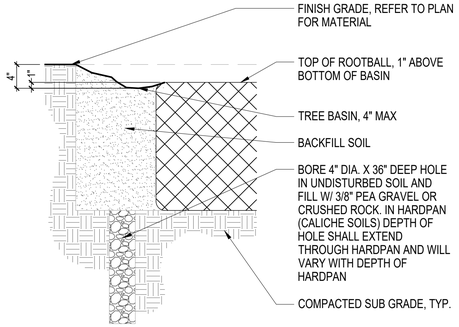
Tucson Electric Power Company
TUCSON, ARIZONA

TITLE: SITE DEVELOPMENT
IRRIGATION PLAN
PATRIOT SUBSTATION

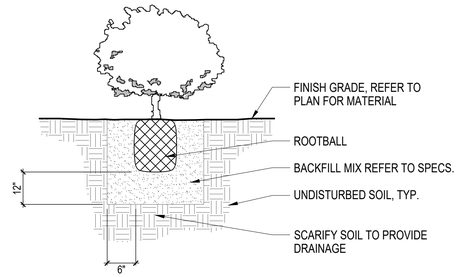
TRSQ T14S,15E,S31
REF # N/A
DWG # 0398-138-04-0010
REV 00
SHEET C10



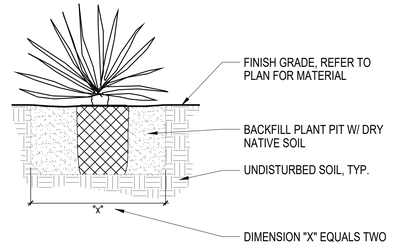
NOTES:
1. DIMENSION "X" EQUALS TWO (2) TIMES THE BOX WIDTH, DEPTH OF PIT WILL EQUAL DEPTH OF ROOTBALL.
2. SCARIFY SIDES & BOTTOM OF PIT, & BORE HOLES ON ALL PITS.
3. SET CROWN OF ROOTBALL 1/2" TO 1" ABOVE FINISH GRADE TO ALLOW FOR SETTLEMENT.
4. DO NOT COVER CROWN WITH SOIL.
5. ROOT GUARDS SHALL BE PROVIDED ON ALL SIDES WHERE ADJACENT HARDSCAPE IS WITHIN 10' OF THE TREE/PLANT.
6. REFER TO TREE STAKING DETAIL FOR ADDITIONAL INFORMATION.



NOTES:
1. TREE BASINS NOT TO EXCEED 4" DEPTH.
2. TOP OF ROOTBALL TO BE EXPOSED TO SURFACE.
3. BOTTOM OF PLANT PIT EQUAL TO DEPTH OF ROOTBALL.



NOTES:
1. SET CROWN OF ROOTBALL 1/2" TO 1" ABOVE FINISH GRADE TO ALLOW FOR SETTLEMENT.
2. DO NOT COVER CROWN WITH SOIL.
3. SETTLE BACKFILL BY WATERING, AND COMPACT TO REMOVE AIR POCKETS.



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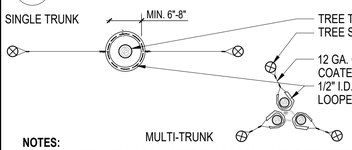
1 15 GALLON & 24IN BOX - TREE PLANTING

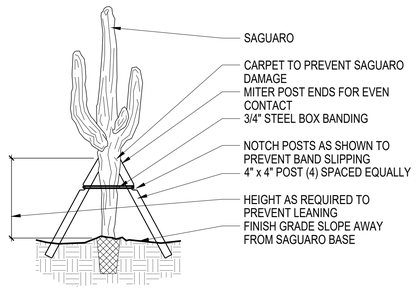
NTS



NOTES:
1. TREES SHALL ONLY BE STAKED THAT ARE NOT SELF-SUPPORTIVE WITH NURSERY STAKE REMOVED. CONTRACTOR SHALL INCLUDE IN BIDDING TO STAKE ALL TREES AS NECESSARY THROUGH WARRANTEE AND MAINTENANCE PERIOD.

2 TREE BASIN

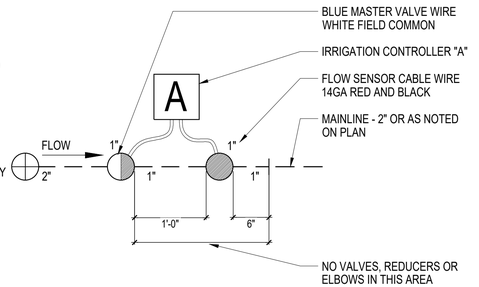
NTS



NOTES:
1. DUST ALL ROOT ENDS WITH SOIL SULFUR.
2. CONTRACTOR TO USE ONLY SAGUAROS ORIENTED WITH TRUE NORTH & SOUTH LOCATED IN HOLE WITH USE OF COMPASS.
3. BACKFILL TO BE NATIVE SOIL TREATED WITH SOIL SULFUR, HAND TAMPED FIRMLY INTO PLACE.
4. ALL ROOTS SHALL BE PRUNED AT 90°.
5. SAGUAROS UNDER 6' IN HEIGHT DO NOT REQUIRE SUPPORT POSTS.

3 SHRUB PLANTING

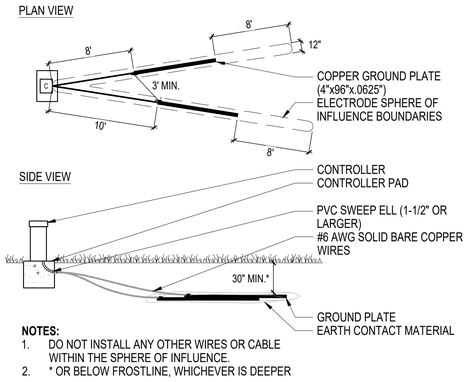
NTS



NOTE:
INSTALL MASTER VALVE AND FLOW SENSOR PER REQUIRED 10 - 5 RULE.
10 TIMES DIAMETER BEFORE AND 5 TIMES DIAMETER AFTER FLOW SENOR FREE OF REDUCERS AND CHANGE IN DIRECTION

4 ACCENT PLANTING

NTS



NOTES:
1. DO NOT INSTALL ANY OTHER WIRES OR CABLE WITHIN THE SPHERE OF INFLUENCE.
2. * OR BELOW FROSTLINE, WHICHEVER IS DEEPER

5 TREE STAKING

NTS

6 FINAL GRADE HARDSCAPE TO DEC. ROCK

NTS

7 SAGUARO PLANTING

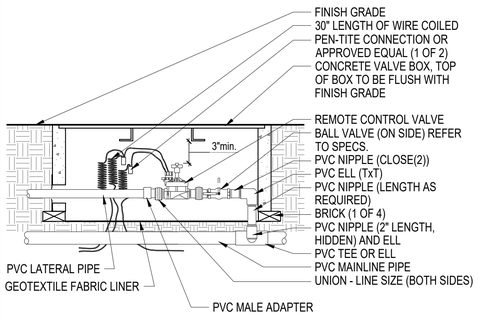
NTS

8 MASTER VALVE AND FLOW SENSOR DIAGRAM

NTS

9 CONTROLLER GROUNDING

NTS



NOTES:
1. PROVIDE DECODERS AS REQUIRED FOR 2-WIRE SYSTEMS.
2. VALVE BOXES SHALL BE OLD CASTLE CHRISTY B1730.

10 REMOTE CONTROL VALVE ASSEMBLY

NTS

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39813
ERIC R. BARRETT
04/21
Date Signed
ARIZONA, USA

EXPIRES 9/30/2021

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LANDSCAPE DETAILS DEVELOPMENT PACKAGE

FOR

TEP PATRIOT SUBSTATION

PARCEL TBD
LOCATED IN NE 1/4 OF SECTION 31, T 14 S, R 15 E, G&SRM,
CITY OF TUCSON, PIMA COUNTY, ARIZONA

DP ___

REF: T21SE00006
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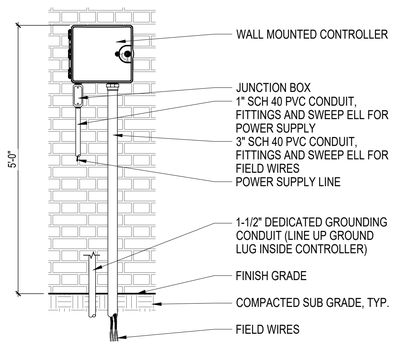
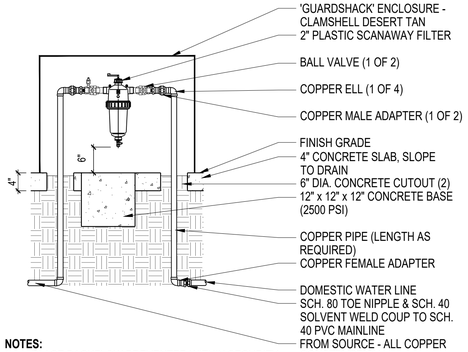
TUCSON, ARIZONA

TITLE: SITE DEVELOPMENT
LANDSCAPE DETAILS
PATRIOT SUBSTATION

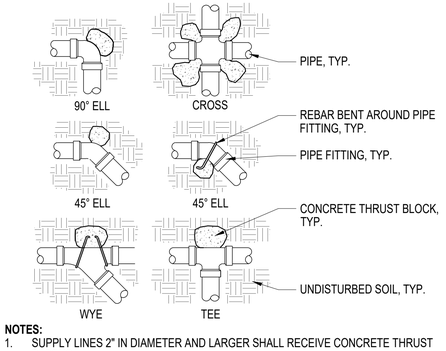
TRSQ T14S,15E,S31
REF # N/A
DWG # 0398-138-04-0011
REV 00
SHEET C11



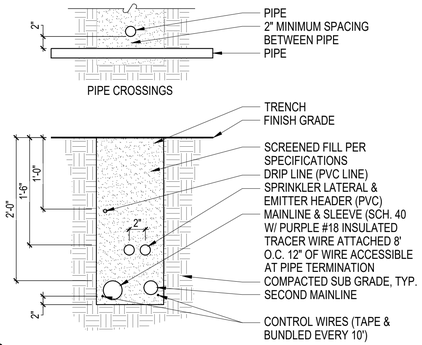
NOTES:
1. PROVIDE PROPER GROUNDING COMPONENTS TO ACHIEVE GROUND RESISTANCE OF 10 OHMS OR LESS.



NOTES:
1. PLACE BACKFLOW PREVENTER WITHIN SECURITY ENCLOSURE SIZED AS REQUIRED. (SEE SPECIFICATIONS)
2. OPEN AND CLOSE ENCLOSURE WITHOUT MODIFICATION.



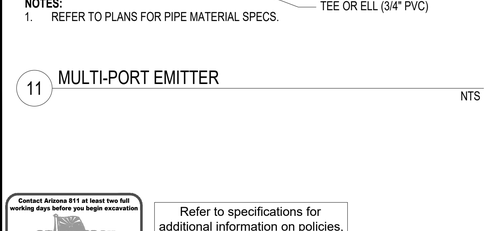
NOTES:
1. SUPPLY LINES 2" IN DIAMETER AND LARGER SHALL RECEIVE CONCRETE THRUST BLOCKS.
2. 1 CUBIC FOOT OF CONCRETE TO BE USED FOR EACH THRUST BLOCK.
3. WRAP PLASTIC SHEETING AROUND PIPE WHERE IT CONTACTS CONCRETE.



NOTES:
1. ALL MAINLINES TO BE INSTALLED IN ACCORDANCE W/ MANUFACTURER'S SPECIFICATIONS.
2. TRENCH WIDTH & DEPTH TO VARY DEPENDING ON NUMBER & TYPES OF PIPES CONTAINED THERE IN.
3. TRACER WIRE AND METALLIC TAPE INSTALLED WITH MAINLINES.
4. 4" PIPE & LARGER SHALL BE 30" BELOW FINISH GRADE.

1 WALL MOUNTED CONTROLLER

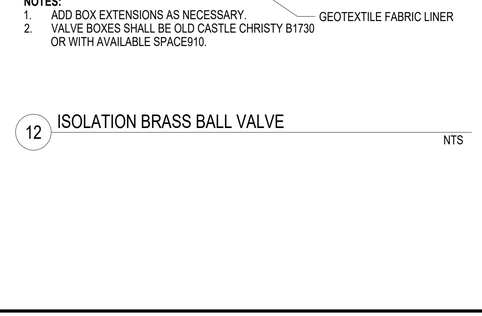
NTS



NOTES:
1. ALL PVC IRRIGATION SLEEVES TO BE SCH. 40 PVC PIPE.
2. ALL JOINTS TO BE SOLVENT WELDED AND WATERTIGHT.
3. WHERE THERE IS MORE THAN ONE SLEEVE EXTEND THE SMALLER SLEEVE TO 24" MINIMUM ABOVE FINISH GRADE.
4. MECHANICALLY TAMP BACKFILL SOIL TO 95% PROCTOR.

2 AMIAD FILTER

NTS



NOTES:
1. PROVIDE DECODERS AS REQUIRED FOR 2-WIRE SYSTEMS.
2. VALVE BOXES SHALL BE OLD CASTLE CHRISTY B1730.

3 MAIN LINE THRUST BLOCK

NTS

NOTES:
1. INSTALL DISTRIBUTION TUBES EQUALLY AROUND EDGE OF ROOTBALL. DRIP TUBING AT SURFACE TO CLEAR FINAL GRADE BY A MIN. OF 1" AND A MAX. OF 2". DETAIL REPRESENTS TYP. INSTALLATION REFER TO IRRIGATION LEGEND FOR MULTI-PORT EMITTER QUANTITIES.

4 IRRIGATION TRENCHING

NTS

NOTES:
1. ALL 1/2" LATERAL PIPE TO BE CLASS 315 PVC. ALL PIPE 3/4" TO 2-1/2" TO BE SCH. 40 PVC, PIPE 3" AND LARGER TO BE CLASS 200 PVC OR AS NOTED ON IRRIGATION LEGEND.
2. MAIN LINE - SCH. 80 FITTINGS.
3. LATERAL AND DRIP LINES SCH. 40 FITTINGS.
4. PRESSURE TESTS, 4 HOURS:
   - MAIN LINE AT 150 PSI
   - LATERALS AND DRIP LINE AT 70 PSI

PIPE SIZE	FLOW (GPM)
1/2"	0 - 5
3/4"	5 - 10
1"	10 - 12
1-1/4"	12 - 20
1-1/2"	20 - 30
2"	30 - 46
2-1/2"	46 - 60
3"	60 - 110
4"	110 - 190
6"	190 - 340

8 PIPE SIZING SCHEDULE

NTS

NOTES:
1. REFER TO PLANS FOR PIPE MATERIAL SPECS.
2. VALVE BOXES SHALL BE OLD CASTLE CHRISTY 910.

5 SLEEVING

NTS

NOTES:
1. REFER TO PLANS FOR PIPE MATERIAL SPECS.

6 REMOTE CONTROL VALVE - DRIP/BUBBLER

NTS

NOTES:
1. ADD BOX EXTENSIONS AS NECESSARY.
2. VALVE BOXES SHALL BE OLD CASTLE CHRISTY B1730 OR WITH AVAILABLE SPACE910.

7 MULTI-PORT EMITTER DRIP TUBING @ TREE

NTS

9 HOSE END CAP

NTS

10 SINGLE OUTLET EMITTER

NTS

NOTES:
1. REFER TO PLANS FOR PIPE MATERIAL SPECS.

11 MULTI-PORT EMITTER

NTS

12 ISOLATION BRASS BALL VALVE

NTS

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811
Call 811 or click Arizona811.com

Refer to specifications for additional information on policies, performances, and products.

REGISTERED LANDSCAPE ARCHITECT
CERTIFICATE NO.
39813
ERIC R. BARRETT
04/21
Date Signed
ARIZONA, U.S.A.

EXPIRES 9/30/2021

SCALE AS NOTED
APRIL 2021

ARC STUDIOS
3117 E. Flower Street
Tucson, Arizona 85716
phone: 520.882.9655
www.arcstudiosinc.com
landscape architecture . urban design
environmental services . irrigation design

ARC STUDIOS PROJECT NO: 01-20078

IRRIGATION DETAILS DEVELOPMENT PACKAGE

FOR

TEP PATRIOT SUBSTATION

PARCEL TBD
LOCATED IN NE 1/4 OF SECTION 31, T 14 S, R 15 E, G&SRM,
CITY OF TUCSON, PIMA COUNTY, ARIZONA

DP ___

REF: T21SE00006
COT ADMINISTRATIVE ADDRESS:
6980 EAST ESCALANTE ROAD
TUCSON, ARIZONA 85707

REVISIONS

DATE	ENG	TECH	REV

DESCRIPTION:
ISSUED FOR CONSTRUCTION
PAT SUB DEV PLAN
JOB No. 10449.00 / WO 6297641

TUCSON ELECTRIC POWER
3950 E IRVINGTON RD.
TUCSON, AZ 85714
ATTN: JESUS MARTINEZ
520-396-2551

VENDOR

NAME: DRAWING #: SHOP ORDER #: TEP PO #:

AUTOCADD

Tucson Electric Power Company
TUCSON, ARIZONA

TITLE: SITE DEVELOPMENT
IRRIGATION DETAILS
PATRIOT SUBSTATION

TRSQ	T14S,15E,S31
REF #	N/A
DWG #	0398-138-04-0012
REV	00
SHEET	C12

SECTION 32 01 90 - OPERATION AND MAINTENANCE OF LANDSCAPE AND IRRIGATION

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. The work shall consist of furnishing all labor, tools, motorized and non-motorized equipment, vehicles, appliances, materials, permits, insurance, and taxes as necessary to execute complete grounds maintenance of the entire project. The work shall include, but not necessarily be limited to, the following work:
   1. Litter control
   2. Weed control
   3. Pest and disease control
   4. Rodent control
   5. Irrigation system maintenance
   6. Plant replacement
   7. Pruning
   8. Seed establishment
   9. Sweeping and washing of sidewalks, curbs, paving, tables and benches.
   10. Cleaning and raking of planting and field areas
   11. Temporary protection

1.02 MAINTENANCE PERIOD

A. On site maintenance from start of construction through Town acceptance.

B. On site maintenance period shall be three hundred sixty five (365) days from town acceptance and written substantial completion of the project.

1.03 MAINTENANCE ACTIVITY

A. Maintenance shall be performed a minimum of one time per week.

B. Work which the contractor fails to do when necessary during the maintenance period may be performed by others as directed by the owner, the cost to be borne by the contractor.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Materials for irrigation and landscaping maintenance shall be as specified in the irrigation and landscaping sections, respectively. Materials shall not be used until they have been approved by the owner who shall have the power to reject any material or defective workmanship.

PART 3 - EXECUTION

3.01 TREE SUPPORTS

A. Maintain tree support ties, hoses, guy wires, tree stakes and wires which maintain upward and proper support of the trees. Protect the trees from wind and storm damage. Allow for movement of the trunks to encourage strong growth of trunks.

B. Tree supports ties and hoses shall be adjusted during the maintenance period to maintain loose connection with tree trunks and minimize possible girdling to tree trunks.

3.02 LITTER REMOVAL AND CLEAN UP

A. All litter and dead vegetation which is loose shall be removed from the entire project site at intervals not to exceed seven (7) calendar days all zones.

B. Contractor shall clean concrete curbs, sidewalks, and other paving by sweeping and hosing down as necessary on a weekly basis for all zones.

3.03 WEED CONTROL

A. Weed control shall be provided over the entire project site through the use of herbicides and manual labor, which method or methods shall be at the discretion of the contractor. Grass type weeds (bermuda) and other weeds which spread by underground roots shall be permanently eradicated by the use of translocating herbicides, such as ' Round-Up'.

B. Weed control within on site shall consist of sonoran desert invasive species elimination and eradication:
   1. Contractor shall review entire site invasive species.
   2. Contractor shall remove, by mechanical means, invasive species from landscape areas throughout the site. Confirm identification of invasive species in field with landscape architect or owner representative. Invasive species that may be found on this site include, but are not limited to; Salsola sp. (Russian thistle), Penniestem ciliare (Buffelgrass), Pennisetum setaceum (Fountain Grass) , Bromus rubens (Red Brome), Cynodon dactylon (Bermuda Grass), Eragrostis lehmanniana (Lehmann Lovergrass), Schismus barbatus (Mediterranean Grass), Schismus arabicus (Arabian Grass), Mellinis repens, Arundo donax (Giant Reed), Cortaderia selloana (Pampas Grass), Centurea melitensis (Malta starthistle), Brassica tournefortii (Sahara mustard), Sisymbrium irio (London rocket), Eurca vesicaria (Garden Rocket), Alhagi maurorum (Camelthorn), Mesembryanthemum crystallinum (Ice plant), Tamarix ramosisima (Saltcedar), Rhus lancea (African sumac), Ailanthus altssima (Tree of Heaven.)
   3. Contractor shall provide a written summary of severity of invasive species found, duration of labor force, and means of eradication.
   4. Contractor shall review weeded areas each month of the construction schedule, providing a written summary for each treatment and continue treatment of invasive species for the length of the contract including the maintenance period.
   5. Contractor must eradicate invasive species by mechanical means or manual means wherever possible. If chemical means of removal is deemed necessary the contractor must submit a report outlining:
      (a) justification for use of chemical herbicides
      (b) Plan showing limits of chemical application
      (c) Product information
   6. Approved chemical control shall be applied when plants are in active growing periods with at least 80% of plant green, typically during the summer rainy period and early fall. All chemical applications shall be per manufacturer's instructions.
   7. Mechanical control by means of pulling or digging to remove plants from the native landscape shall be preformed during the fall and early spring.
   8. Mowing and cutting are not consider as an appropriate means for the site due to the geographical nature of the site.

C. Organic and synthetic herbicides employed during the term of the maintenance period shall not cause the extermination of any landscape plant nor have detrimental side effects.

D. No chemical or other materials shall stain or cause to stain, nor cause damage to any portion of the site or improvements, including landscape plant material. If staining or damage occurs, requisite repairs or replacements shall be made by the contractor.

E. A record shall be kept of all chemical applications noting the date applied, location of application, rate of application, whether pre-emergent or post-emergent, and method of application. A copy shall be submitted to the owner at the end of the maintenance period.

F. Applications of chemicals shall be in such a manner so as not to cause injury to the personal health of anyone working on the site, observing, or passing by. Care shall be taken such that no puddles or pools of water which contain toxic amounts of chemicals remain after completion of operations. Chemicals shall not be allowed to fall on or translocate to other areas of the site.

G. Chemicals shall be approved by the EPA for the intended use and applied in strict accordance with EPA guidelines and the manufacturer's instructions. Chemicals shall be applied by an individual with proper training and possessing the required licenses and certifications for applying herbicides and other chemicals in the State of Arizona.

3.04 PEST AND DISEASED CONTROL

A. All landscape plants and turf grass shall be provided protection which shall include, but not be limited to, eradication or control of insects, mites, fungi, and non-fungus diseases through the application of appropriate insecticides, miticides, and fungicides, approved by owner representative, which shall in from be sprays or dusts.

B. All insecticides, fungicides, and miticides employed during the term of the Contract shall not cause extermination of any landscape plant material, nor cause damage to the growth characteristics such that the plants will not be able to recover in a normal manner.

C. All precautionary provisions of paragraph " Weed Control" shall apply to the application of pest and disease control chemicals.

3.05 HYDRO SEEDED REVEGETATED AREAS.

A. Refer to section 32 92 19 Hydraulic Seeding.

B. Germinated plants and forbes shall be left to grow in a natural state with little to no maintenance. Germinated areas shall only be addressed due to conflict with operations of the port or visibility concerns and shall be addressed on an as needed bases directed by the owner.

C. Non native species and undesired plants that occur within these areas shall be treated per Section 3.03 WEED CONTROL within this specification.

3.06 PRUNING AND SHRUB TRIMMING

A. Pruning of plants shall be done in a manner which preserves the plant's natural growth characteristics and appearance. No shearing will be allowed. Any plant sheared by maintenance company shall be replaced with like size and kind at no additional cost to the owner.

B. Trees shall be left in natural state when ever possible. Trees shall only be pruned to remove view obstructions, cross branching, and deadwood and mistletoe as directed by owner. Trees near pedestrian walkways and vehicle traffic shall be pruned up to allow clear viewing and access for pedestrians on sidewalks. Trees shall be maintained up to 12 feet high at no additional cost to owner.

C. Native plants shall only be trimmed to remove dead or diseased branches at their point of origin.

D. Shrub and accent plants generally will not require any pruning. Pruning shall only be done to remove dead, diseased, or damaged branches.

E. Shrub and accent plants located within near pedestrian areas or vehicle viewing areas has be hand trimmed to control branches which impact walkways or impede viewing and shall be trimmed as directed by owner.

3.07 INERTS

A. Landscape areas with decomposed granite, crushed stone and sized rock shall be raked to maintain a finished appearance. Replace material which is removed, damaged or otherwise no longer suitable for the use in which it was intended with like size and color.

B. Rip rap in retention basins, at splash pads and other landscape areas shall be kept free of debris and litter and checked weekly and following storms.

3.08 PLANT REPLACEMENT

A. All landscape plant material determined by the Owner to possess health or vigor insufficient to develop a normal plant habit shall be replaced by the Contractor within ten (10) calendar days after receipt of notification.

B. Replacements shall be of the same genus, species, and variety and of the same size as originally provided.

C. Following replacement, regardless of nature, the immediate and adjacent areas shall be left "broom clean" and in such appearance as prior to the aforementioned operations.

3.09 IRRIGATION

A. Irrigation shall be operated at programmed intervals as necessary to maintain vegetation to the different planting zones while promoting good, sturdy, growth of all plant material and hydro seed.

B. Precautions shall be taken to avoid soil erosion by the irrigation system. Soil eroded by the irrigation system shall be regarded or replaced with topsoil conforming to the landscape specifications.

C. The entire irrigation system shall be maintained by the Contractor to insure balanced and necessary watering. This maintenance shall include, but not be limited, to the following:
   1. Removal of sand and debris causing restriction within the emitter orifices.
   2. Flushing of drip system filters as required to remove debris.
   3. Review filter and replace filters screens as necessary.
   4. Necessary timing adjustments to the automatic controller(s), as provided within the mechanism of the equipment. Refer to programming below.
   5. Adjustment of spray heads to maintain efficient, uniform application of water to hyrdo-seeded areas.
   6. Adjusting spray heads to minimize overspray onto adjacent building, paved surfaces and other non-landscape areas.
   7. Repair or replacement of damage caused by the Contractor. All such repairs or replacements shall be subject to the approval of the Owner.

D. The entire irrigation system shall be adjusted to focus watering to the entire site. The irrigation controllers shall be programmed annually for overall water usage and adjusted yearly for the different landscape vegetation zones. Necessary timing adjustments shall be tied to the evaporstrasporation (ET) connected to the Irrigation controllers.

E. Fine adjustments to the irrigation controllers is vital to preserve water supply and reflect site specific micro-climate conditions for plant with the automatic controllers. Sun exposures like east and west, slopes, and slope faces east, south and west shall be reviewed and each valve shall be adjusted to reflect these different growing conditions which will in turn impacted the plant material.

3.10 RODENT CONTROL

A. Rodents, especially burrowing rodents, shall be controlled on the entire project site by the Contractor, using methods approved by the Owner. Control methods shall safeguard the public from tripping and falling hazards from rodent burrows, rodent spread diseases, etc.

B. Contractor shall take immediate action to preserve vegetation from rodents and insects. Contractor negligence on rodent and insect invasions shall be replaced at no additional cost to the owner. Contractor shall replace plant material when bark is stripped and/or plant cut back is beyond 50% of overall plant.

3.11 CONTRACTOR'S RESPONSIBILITY

A. This Contractor shall be bound by all requirements of the General Conditions and Specifications which in any way apply to his work.

3.12 SUMMARY REPORT.

A. The contractor shall submit a summary report weekly to the owner representative identifying the tasks preformed per the maintenance specifications.

B. The summary report shall include date, duration of work, work force, work preformed that day, items of concern that need attention, erosion damage, notation of irrigation adjustments, and rodent activities and estimate tasks for the coming week.

C. Reports shall be submitted in electronic format with mark-ups noted on accompanying site plan of actions items and work performed.

3.13 INSPECTIONS

A. The Owner, accompanied by the Contractor, will inspect the site at monthly intervals for the duration of the construction project and at least twelve times during the maintenance period, at its expiration, and at other times deemed necessary by the Owner or owner representative. When, in the opinion of the Owner, the methods being used to control or eradicate pests and weeds or perform other maintenance functions are unsatisfactory, the Contractor shall immediately modify his methods, as directed by the Owner. Final acceptance of the project shall be granted after satisfactory completion of the Maintenance period.

END OF SECTION 32 01 90

SECTION 32 84 23 - PLANTING IRRIGATION

PART 1 - GENERAL

1.01 SUMMARY

A. Furnish all work and material, appliances, tools, equipment, facilities, transportation, and services necessary for and incidental to performing all operations in connection with the installation of underground sprinkler system complete, as shown on drawings and/or specified herein. When the term "Contractor" is used in this section, it shall refer to the irrigation contractor.

1.02 RELATED DOCUMENTS

A. Conditions of the contract and Division 1 General Conditions are hereby made a part of this section.

1.03 APPLICABLE STANDARDS

A. ASTM D2241 - Poly (Vinyl Chloride)(PVC) Plastic Pipe (SDR-PR)

B. D2464 - Poly (Vinyl Chloride)(PVC) Plastic Pipe Fittings, Threaded, Schedule 40

C. D2564 - Solvent cements for Poly (Vinyl Chloride)(PVC) Plastic Pipe and Fittings

D. D2855 - Making Solvent - Cemented Joints with Poly (Vinyl Chloride)(PVC) Pipe and Fittings

E. F-477 - Gasket Pocket Pipe

1.04 WARRANTEE AND MAINTENANCE

A. Warrantee:
   1. The Contractor is required to guarantee the irrigation system in accordance with the requirements below. A copy of the guarantee form shall be included in the Operations and Maintenance Manual. The guarantee form shall be on the Contractor's letterhead and contain the following information:
      GUARANTEE FOR SPRINKLER IRRIGATION SYSTEM
      We hereby guarantee that the irrigation system we provided to be free from defects in materials and workmanship, and the work has been completed in accordance with the drawings and specifications, ordinary wear and tear, and unusual abuse or neglect excepted. We agree to repair or replace any defects in material or workmanship including repair of backfill settlement which may develop during the period of two (2) years from the date of Substantial Completion and to repair or replace any damage related to such defects at no additional cost to the Owner. We shall make such repairs or replacements within a reasonable time, as determined by the Owner, after receipt of written notice from the Owner, we authorize the Owner to proceed to have said repairs or replacements made at our expense and we will pay the costs and charges therefore upon demand.
      Project: _____
      Location: _____
      Signed: _____
      Address: _____
      Phone: _____
      Date of Acceptance:_____
      (Contractor to complete upon project acceptance)

B. Maintenance
   1. Work shall include but not be limited to:
      a. Adjustment of sprinkler height and plumb to compensate for settlement and/or plant growth.
      b. Backfilling of all trenches.
      c. Adjustment of head coverage (arc of spray) as necessary.
      d. Unstopping heads plugged by foreign material.
      e. Adjustment of controller as necessary to insure proper sequence and watering time.
      f. All maintenance necessary to keep the system in good operating condition.
   2. Exclusions
      a. Guarantee and maintenance after final acceptance does not include alterations as necessitated by re-landscaping, regrading, addition of trees or the addition and/or changes in sidewalks, walls, driveways, etc., except to the extent that such work is caused or necessitated by the irrigation Contractor or his general Contractor.

1.05 SUBMITTALS

A. The Contractor shall submit to the Owner's Representative PDF copy of shop drawings or manufacturer's "cut sheet" for: booster pump, each type of rotor head, pipe, controller, valves, check valve assemblies, valve boxes, wire, conduit, fittings and all other equipment noted within the plans, legends, and details for the types of fixtures and equipment which he proposes to install on the job. The submittal shall include the manufacturer's name, model number, equipment capacity and manufacturer's installation recommendation, if applicable, for each proposed item.

B. Substitutions of products shall only occur during the bidding process. Substitutions shall be made 10 business days prior to bid date for consideration of use and must be accepted by owner's representative (2) business days prior to bid submittal for bid uniformity.

C. A contract will not be issued to the Contractor until he has submitted the required information. No partial submittal will be accepted and submittals shall be neatly bound into a brochure and logically organized. After the submittal has been approved, substitutions will not be allowed except by written consent of the Owner's Representative.

D. Shop drawings
   1. Include dimensions, elevations, construction details, arrangements and capacity of equipment, as well as manufacturer's installation recommendations.

E. Record Drawings
   1. Record dimensioned locations and depths for each of the following:
      a. Irrigation main line routing (Provide dimensions for each 100 lineal feet (maximum) alone each routing, and for each change in directions).
      b. Isolation Valves, Irrigation control valves, Control wire routing, Sleeves under paving and other related items as may be directed by the Owner's Representative.

F. Dimensioning
   1. Locate all dimensions from two permanent points (buildings, monuments, sidewalks, curbs or pavements).

G. Changes
   1. Record all changes which are made from the Contract Drawings, including changes in the pressure and non-pressure lines.
   2. Record all required information on a set of blackline prints of the drawings. Do not use these prints for any other purpose.
   3. Maintain information daily. Keep drawings at the site at all times and available for review by the Owner's Representative.

H. Record Drawing Submittal
   1. When record drawings have been approved by the Owner's Representative, transfer all information to a clean set of Bond Irrigation Plan set using permanent Blue ink.
   2. Changes using ball point pen are not acceptable.
   3. Make dimensions accurately at the same scale used on the original drawings, or larger.
   4. If photo reduction is required to facilitate controller chart housing, notes or dimensions shall be a minimum 1/4" in size.
   5. Reproducible mylars will be furnished by the Owner's Representative at cost for printing and handling.

1.06 CONTROLLER CHARTS

A. Do not prepare charts until record drawings have been approved by the Owner's Representative.

B. Provide one controller chart for each automatic controller installed. Chart may be a reproduction of the Record Drawing, if the scale permits the chart to fit into the controller door. If photo reduction prints are required, keep reduction to maximum size possible to retain full legibility.

C. Chart shall be blackline print of the actual system showing the area covered by that controller. Identify the area of coverage of each remote control valve, using a distinct different pastel color drawn over the entire area of coverage.

D. Following approval of charts by the Owner's Representative, they shall be sealed between two layers of 20 mil plastic sheets.

E. Charts must be completed and approved prior to final acceptance of the irrigation system.

1.07 OPERATING AND MAINTENANCE MANUAL

A. Provide two individually bound manuals detailing operating and maintenance requirements for the irrigation system.

B. Manuals shall be delivered to the Owner's Representative no later than 10 days prior to completion of work.

C. Provide descriptions of all installed materials and systems in sufficient detail to permit maintenance personnel to understand, operate and maintain the equipment.

D. Information Required
   1. Index sheet, stating the Irrigation Contractor's name, address, telephone number and name of person to contact, Duration of guarantee period, Equipment list providing the following for each item:
      a. Manufacturer's name
      b. Make and model number
      c. Name and address of local manufacturer's representative
      d. Spare parts list in detail
      e. Detailed operating and maintenance instructions for major equipment

1.08 SUBSTITUTION OF MATERIALS

A. This irrigation system has been designed around the irrigation components herein stated and as shown on the plans. Any changes of brand name, trade name, trademarked, patented articles, or any other substitutions will be allowed only by written order sighed by the Owner's Representative. The Owner is under no obligation to accept materials other than as specified. If a bidder wishes for a substitute item to receive consideration as an approved equal, the bidder and each item must meet all the following requirements without exceptions.
   1. Criteria
      a. An item, to be considered a substitute, must meet the same specifications of materials, fabrication or construction, dimension or size, shape, finish, performance standards, warranty or guarantee, and any other pertinent and salient features of quality, as indicated in manufacturer's specifications for the original specified item.
   2. Submittal for Consideration
      a. A sample of the item, along with a written request for consideration, shop drawings, and written specifications, must have been received by the Owner's Representative a minimum of ten (10) calendar days after bid opening date. The item shall then be examined, and the bidder shall be notified, in writing, seven (7) days later, whether or not the item is an approved equal. The Owner's Representative shall be the final judge of whether or not an item submitted for consideration qualifies as being an acceptable substitute.
      b. Under no circumstances shall an item be given consideration as an "approved equal" substitute later than ten (10) days after the bid opening. After that date, all items shall be furnished per the original specifications. Likewise, unless certified as "approved equal" per the time frame and the requirements above, the successful bidder (known as Contractor after signing the contract) shall install all items per the original plans and specifications. Equipment or material installed or furnished without prior approval of the Owner's Representative as herein specified, may be rejected and the Contractor required to remove such materials at his own expense.
      c. The Contractor alone shall bear complete responsibility for the installation and operation of any material or equipment installed on the job (as a substitute for specified equipment or material) should such substituted material prove to be defective, inoperable or inapplicable.
   3. Codes and Permits
      a. All work under this contract shall comply with the provisions of these specifications, as illustrated on the accompanying drawings, or as directed by the Owner's Representative and shall satisfy all applicable local codes, ordinances, or regulations of the governing bodies and all authorities having jurisdiction over this project.
      b. Installation of equipment and material shall be done in accordance with the requirements of the National Electric Code, local and national Plumbing Codes and standard plumbing procedures. The drawings and these specifications are intended to comply with the necessary rules and regulations; however, some discrepancies may occur. Where such discrepancies occur, the contractor shall immediately notify the Owners Representative in writing of the discrepancies and apply for an interpretation. Should the discovery and notification occur after the execution of a contract, any additional work required for compliance with the regulations shall be paid for as covered by these contract documents.
      c. The Contractor shall give all necessary notices, obtain all permits and pay all costs in connection with his work; file with all Owner departments having jurisdiction; obtain all required certificates of inspection for his work and deliver to the Owner's Representative before request for acceptance and final payment for his work.
      d. The Contractor shall include in the work any labor, materials, services, apparatus or drawings in order to comply with all applicable laws, ordinances, rules and regulations whether or not shown on the drawings and/or specified.

1.09 QUALITY ASSURANCE

A. The installation of the irrigation system shall be made by an individual or firm duly licensed under the State of Arizona Registrar of Contractors.
   1. Superintendent: A superintendent satisfactory to the Owner's Representative shall be on in the employ of the Contractor and shall be on the site at all times while the specified herein is being performed.
   2. The superintendent shall not be changed, except with the consent of the Owner's Representative
   3. The superintendent shall be authorized to represent the Contractor.
   4. The superintendent shall have a minimum of 7 years irrigation installation experience and a minimum of 2 years supervisory experience.

1.10 NOTIFICATION OF OWNER'S REPRESENTATIVE

A. The Owner's Representative shall have free access to the work whenever it is in preparation or progress and proper facilities for such access and inspection. The Contractor shall notify the Owner's Representative when he will and will not be on the job. Should the Contractor work periodically on the job, the Owner's Representative shall have the right to require the Contractor to give a 24 hour notice of each and every day or partial day that he intends to work on the project. The Contractor shall perform no work unless the Owner's Representative has been properly notified. Failure to notify the Owner's Representative may require the Contractor to redo, uncover pipe, expose for inspection, etc., all that the Owner's Representative was unable to inspect.

1.11 EXISTING UTILITIES

A. Location and Elevations: The Contractor shall examine the site and verify to his own satisfaction the locations and elevations of all utilities both public and private and availability of utilities and services required. The Contractor shall inform himself as to their relation to the work and the submission of bids shall be deemed as evidence thereof. The Contractor shall repair at his own expense, and to the satisfaction of the Owner's Representative, for damage to any utility shown or not shown on the plans.

B. Should utilities not shown on the plans be found during excavations Contractor shall promptly notify Owner's Representative for instructions as to further action.

C. Contractor shall make necessary adjustments in the layout as may be required to connect to existing stubouts, should any such stubouts not be located exactly as shown and as may be required to work around existing work, at no increase in cost to the Owner.

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811
Call 811 or click Arizona811.com

REGISTERED LANDSCAPE ARCHITECT
CERTIFICATE NO.
39813
ERIC R. BARRETT
04/21
Date Signed
ARIZONA U.S.A.
EXPIRES 9/30/2021

SCALE AS NOTED
APRIL 2021

ARC STUDIOS
3117 E. Flower Street
Tucson, Arizona 85716
phone: 520.882.9655
www.arcstudiosinc.com
landscape architecture . urban design
environmental services . irrigation design

ARC STUDIOS PROJECT NO: 01-20078

LANDSCAPE SPECIFICATIONS DEVELOPMENT PACKAGE

FOR

TEP PATRIOT SUBSTATION

PARCEL TBD
LOCATED IN NE 1/4 OF SECTION 31, T 14 S, R 15 E, G&SRM,
CITY OF TUCSON, PIMA COUNTY, ARIZONA

DP ___

REF: T21SE00006
COT ADMINISTRATIVE ADDRESS:
6980 EAST ESCALANTE ROAD
TUCSON, ARIZONA 85707

REVISIONS

DATE	ENG	TECH	REV

DESCRIPTION:
ISSUED FOR CONSTRUCTION
PAT SUB DEV PLAN
JOB No. 10449.00 / WO 6297641

TUCSON ELECTRIC POWER
3950 E IRVINGTON RD.
TUCSON, AZ 85714
ATTN: JESUS MARTINEZ
520-396-2551

VENDOR

NAME: DRAWING #: SHOP ORDER #: TEP RO #:

AUTOCADD

Tucson Electric Power Company
TUCSON, ARIZONA

TITLE: SITE DEVELOPMENT
LANDSCAPE SPECIFICATIONS
PATRIOT SUBSTATION

TRSQ T14S,15E,S31
REF # N/A
DWG # 0398-138-04-0013
REV 00
SHEET C13

All such work will be recorded on record drawings and turned over to the Owner's Representative prior to final acceptance.

1.12 COOPERATION

A. Work under this contract may be accomplished with other Contractors and trades on the project site at the same time. The Contractor shall allow each Contractor and trade adequate time at the proper stage of construction to fulfill his contract

1.13 ELECTRIC POWER

A. Electric power to operate the controller is existing at the controller locations except as noted on the Construction Drawings. Service wiring to the controller cabinet shall be furnished by the irrigation contractor.

1.14 WATER FOR TESTING

A. The Owner shall furnish all water necessary for testing, flushing and jetting.

1.15 EXTRA EQUIPMENT

A. Supply as part of this contract the following tools:
1. Two (2) keys for the automatic controller
2. One (1) Operations Manual

1.16 SLEEVES AND ELECTRICAL CONDUITS

A. Sleeves and electrical conduits will need to be installed as noted on the Construction Drawings. Contractor shall be responsible for timely placement of all sleeves and conduits at no additional cost to the Owner.

1.17 PROGRESS MEETINGS

A. Contractor shall attend all progress meetings as requested by the Owner's Representative during installation and as needed to keep work progressing.

1.18 LOCATING UNDERGROUND FACILITIES

A. All irrigation mainlines and any additional irrigation lateral lines greater than 2" in diameter shall have a purple #18 insulated tracer wire securely attached to it at 8' oc and shall have 12" of tracer wire accessible above grade at the termination and be securely attached at that point.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Unless otherwise noted on the plans, all materials shall be new and unused. This irrigation system has been designed around the irrigation components herein stated and as shown on the plan. Any changes of brand name, trade name, trademarked, patented articles, or any other substitutions will be allowed only by written order as outlined in Section 1.06.

2.02 EQUIPMENT

A. PVC Pressure Mainline Pipe and Fittings. Pressure mainline piping shall be Schedule 40 PVC 1 ¼" - 2 ½" and Class 200 SDR 21 for all pipe larger than 3". Refer to Irrigation Legend.
1. Pipe shall be made from NSF approved type I, grade I PVC compound conforming to ASTM specification D - 2241. Piping up to and including 3" size shall be SDR solvent weld. Pressure mainline piping 4" size and larger to be gasket pocket type as manufactured by the Swanson Company or equal, and shall conform to ASTM F-477.
2. PVC solvent weld fittings shall be Schedule 80k, Type I NSF approved conforming to ASTM test procedure D2466 (for sizes up to and including 3") and shall be as manufactured by Spears, Lasco or Dura.
3. Solvent cement and primer for PVC solvent-weld pipe and fittings shall be Red Hot Blue Glue and Christy's Purple Primer. Manufacturer's installation requirements shall be strictly adhered to.
4. All PVC pipe shall bear the markings showing the Manufacturer's name, Nominal pipe size, Schedule or class, Pressure rating in psi, National Sanitation Foundation (NSF) approval and Date of extrusion.
5. All fittings shall bear the manufacturer's name or trademark, material designation, size, applicable IPS schedule and NSF seal of approval.

B. PVC Non-Pressure Lateral Piping
1. Non-pressure buried lateral line piping shall be PVC Schedule 40 with solvent weld joints for sizes 3/4" to 2-1/2" and Class 200 PVC for line 3" - 4".
2. Pipe shall be made from NSF approved, Type I, Grade II PVC compound conforming to ASTM resin specifications D1784. All pipe shall meet requirements set forth in Federal Specification PS-22-70, for the appropriate standard dimension ratio (SDR).
3. PVC Solvent weld fittings shall be Schedule 40, Type I NSF approved conforming to ASTM test procedure D2466 as manufactured by Spears, Lasco or Dura.

C. Galvanized Pipe & Fittings
1. Where indicated on the drawings and on the details, use galvanized steel pipe ASA Schedule 40 mild steel screwed pipe.
2. Fittings shall be medium galvanized screwed beaded malleable iron. Galvanized couplings may be merchant coupling.
3. All galvanized pipe and fittings installed below grade shall be painted with two coats of Koppers # 50 Bitumastic (except swing joint assembly).

D. Backflow Preventer
1. Backflow Preventer shall be a reduced pressure type of the size shown on the project plans.

E. Isolation Valves
1. Lead Free Brass ball valve similar to those manufactured by Champion or equivalent.

F. Valve Boxes
1. A box shall be provided for all valves and equipment as detailed and specified on the project plans. Boxes shall be suitable in size and configuration for the operability and adjustment of the valve. Extension sections will be used as appropriate to the depth of piping. All valve box covers shall bolt down and shall be colored; purple - reclaimed (non potable) or brown - dg areas and imprinted "irrigation".
2. Boxes for valves shall have a locking or bolt down cover. Box shall be as manufactured by old castle when specified as concrete or Ametek when specified for plastic. Only one remote control valve/gate valve assembly shall be installed per valve box. Box shall be rectangular in shape and be sufficiently large to allow easy access, maintenance and repair of the equipment contained therein.

G. Quick Coupling Valves and Wire Splices
1. Box shall be a 10" diameter round valve box.

H. Electric Control Valves
1. Valve shall be of size indicated on Drawings Valves shall be as indicated on the drawings.

I. Control Wire
1. Control wire shall be UF-UL listed, color coded copper conductor direct burial size 14. Tape control wires to side of main line every 10 feet. Where control wire leaves main or lateral line, bury a minimum of 24" deep. Use 3M DBY waterproof wire connectors at splices and locate all splices within valve boxes. Use white or gray color for common wire and other colors for all other wire. Each common wire may serve only one controller. Do not use black on any 24V circuit. One extra control wire shall be run from panel continuously from valve to valve throughout system controlled by that controller, similar to common wire for use if a wire fails. Wire shall be different color than all other wires, shall not be green, and shall be marked in control box as an extra wire.
2. 2-Wire Systems - Paige or Manufacture specified 2-wire cable. 14/2 Direct Burial, 24" depth. Use 3M DBY waterproof wire connectors at splices and locate all splices within valve boxes. Install Lighting Arrestors every 500 linear Feet or as specified by Controller manufacture's.

J. Irrigation Controller
1. Electric Controllers is existing, Field located and ensure proper functioning prior to start of any construction. Coordinate access and programming of all new stations with Owner Representative and associated Maintenance personnel.

K. Pressure Regulator
1. Self contained, single seat, direct acting, spring loaded, diaphragm actuated type. The valve body shall be of Polyurethane Compound construction or high-impact engineering grade thermoplastics, stainless steel body seat, composition seat discs, BUNA-N diaphragm with nylon insert and stainless steel springs. The valve shall have a maximum working pressure rating of 150 psi and shall have a fixed outlet pressure of 30 psi pressure. The downstream pressure variance shall not exceed a rate of 0.454 psi for every 10 psi variance in upstream or source pressure.

L. Filters
1. Filters used down stream of the Remote Control Valves shall be a Y strainer type with minimum of 200 mesh filtration. The filter shall have a threaded opening to allow attachment of a hose for flushing. The filter shall have features similar to the Rainbird RBY-100MPTX.

M. Emitter Assembly
1. Emitters shall be of the pressure compensating, self flushing type.
2. The cases of the emitters shall be made of durable black, heat resistant acetal plastic material. It shall be resistant to temperature variation, ultraviolet radiation, smog (ozone), common liquid fertilizer and weed spray.
3. The emitter shall be capable of continuous, clog free operation with 140 mesh (minimum) filtration. The emitter shall be capable of being installed in any position and maintain its given flow characteristics. The emitter shall be non adjustable.
4. The emitter shall function with a system pressure range of 15 psi minimum to 50 psi maximum. The emitters shall be available in flow ranges from .5 to 2.0 gph.
5. The emitter assemblies as shown on the plans shall consist of the emitter and .22" OD spaghetti distribution tubing which shall not exceed 8" in length.
6. Trees shall be irrigated with multi-port 2 gph/port, six ports per tree pending of species. Refer to Emitter schedule for required gallons per minute (see plans).

N. Emitter Hose
1. The flexible emitter hose, which shall deliver water to the emitter assembly shall be manufactured from virgin polyethylene material having the following physical characteristics:

O.D.	.704"
I.D.	.600 min.
Wall	.0052"
Carbon Black	1.5 - 3.5
Density	.92 - .93

Melt/Environmental Stress/Crack Resistance 0/100/100
2. Fittings for use with the emitter hose shall be of the compression, internal barb type, constructed of virgin PVC or glass-filled polypropylene materials, and as detailed on the project plans.

O. Sleeves
1. Provide where shown on the drawings and specified herein.
2. All mainlines, lateral line piping, emitter headers and lateral piping and all control wire shall be installed in a sleeve under all paving, walls and concrete surfaces.
3. All sleeving shall be SCH 40 PVC solvent weld pipe.
4. All joints shall be solvent welded.
5. All sleeves shall be installed as detailed on the project plans.
6. All sleeves shall extend a minimum of 18" beyond the edge of the item being sleeved.
7. Each sleeve shall be taped along its entire length with metallic locator tape manufactured for that purpose.
8. Sleeves shall have a minimum horizontal clearance of 12" from each other and other piping. Sleeves shall not be installed parallel and directly over another line. Sleeves shall have a minimum of 9. inches vertical clearance where they cross other lines.

P. Booster Pump: Shall per as specified on plans, Variable frequency drive able to provide minimum pressure and flows as required to provide adequate flow and pressure per the design plans. Pump shall be placed on skid for ease of placement and connection and include and enclosure able to contain power supplies and pump equipment.

Q. Other equipment: Other Components noted within Irrigation legend, Plans or details shall be as specified in plans as recommended by Manufacturer and subject to Architect's review and acceptance and as necessary to complete and make system operational.

PART 3 - EXECUTION

3.01 GENERAL

A. Contractor Responsibility: The Contractor shall not willfully install the irrigation system as shown on the drawings when it is obvious in the field that obstructions, grade differences or discrepancies in equipment usage, area dimensions or static water pressure exist that might not have been considered in the engineering. Such obstructions or differences shall be brought to the attention of the Owner's Representative. In the event this notification is not performed, the Contractor shall assume full responsibility for any revision necessary.

B. All material and equipment shall be delivered to the job site in unbroken reels, cartons or other packaging to demonstrate that such material is new and of a quality and grade in keeping with the intent of these specifications.

3.02 SITE CONDITIONS

A. All scaled dimensions are approximate. The Contractor shall check and verify all size dimensions and receive the Owner's Representative's approval prior to beginning work. Contractor shall be responsible for layout of all equipment and piping in the irrigation system. This layout shall be in conformance with notations on the Construction Drawings.

B. Exercise extreme care in excavating and working near existing utilities. Contractor shall be responsible for damage to utilities which are caused by his operation or neglect. Contractor shall check existing utility drawings and contact Bluestake prior to any excavation.

C. Coordinate installation of irrigation materials, including pipe so there shall be no interference with utilities or other construction or difficulty in planting trees, shrubs and ground covers. Contractor shall coordinate with other trades to insure timely placing of necessary sleeves, wires and pipes under walks, curbs and paving.

D. Design Pressure: This irrigation system has been designed to operate with a minimum static inlet water pressure as shown on the drawings. The Contractor shall take a pressure reading prior to beginning construction. If the pressure reading is less than indicated, the Contractor shall notify the Owner's Representative.

3.03 PREPARATION

A. Prior to installation, the Contractor shall stake out all pressure supply lines, location of remote control valves, sprinkler heads, controllers, backflow preventers, gate valves, quick coupling valves and other irrigation equipment.

B. All layout shall be approved by the Owner's Representative prior to installation. Prior approval shall be obtained for valves, controllers, main line routing, quick coupling valves, backflow preventers, water meters and sprinkler locations.

3.04 WATER SUPPLY

A. Irrigation system shall be connected to the new water mainline at the approximate location shown on the drawings. Contractor is responsible for minor changes caused by actual site conditions and tap locations.

3.05 EXCAVATION AND BACKFILL

A. Trenching
1. Dig trenches straight and support pipe continuously on bottom of trench. Lay pipe to an even grade. Trenching excavation shall follow the layout as approved by the Owner's Representative in the field. If the bottom of a pipe trench excavation is found to consist of rock, caliche, or any other material that, be reason of its hardness or sharpness, cannot be excavated to give a uniform bearing surface, said rock or other material shall be removed for at least three (3) inches below the specified trench depth and refilled to the specified trench depth with sand or other approved shading material.

B. Burial of Pipe
1. Depth of Pipe shall be as shown on the construction details

C. Backfilling
1. The trenches shall not be backfilled until all the required tests are performed. Trenches shall be carefully backfilled in 8" lifts with the excavated materials, less any stone or clods of earth larger than 1/2" in any dimension. Backfill shall be mechanically compacted in landscape areas to a dry density equal to adjacent undisturbed soil. Backfill shall conform to adjacent grades without dips, sunken areas, humps or other surface irregularities. Backfilling shall not be performed while trenches or backfill material is in a wet or muddy condition.
2. A fine granular material backfill will be initially placed on all lines to a depth of 3" over the top of the pipe. No foreign matter or particles larger than 1/2" in any one dimension will be permitted in this backfill. Existing site soil that conforms to this gradation requirement may be used for this initial backfill.
3. Flooding of trenches will be permitted only with approval of the Owner's Representative.
4. If settlement occurs and subsequent adjustments in pipe, valves, sprinkler heads, lawn or planting, or other construction are necessary, the Contractor shall make all required adjustments without cost to the owner. Contractor shall also make repairs or replacements to any item damaged by settlement of trenches or irrigation equipment, whether said item was part of the original scope of construction or not.
5. All buried private irrigation lines greater than 2" in diameter shall have purple #18 insulated tracer wire securely attached to it at 8' o.c. and shall have 12" of tracer wire accessible above grade at the termination and be securely attached at that point.

D. Trenching and backfill under paving
1. Trenches located under areas where paving, asphaltic concrete or concrete will be installed shall be backfilled with sand for a depth of 3" below the bottom of the pipe (or sleeve) and 3" above the top of the pipe (or sleeve). and compacted to 90% compaction or the required subgrade compaction for that area (whichever is greater), using manual or mechanical tamping devices. All trenches shall be left flush with the adjoining grade. The Contractor shall set in place, cap, and pressure test all piping under paving prior to the paving work.
2. Provide for a minimum cover of 18" between the top of the pipe and the bottom of the aggregate base for all pressure and non-pressure piping installed under asphaltic concrete paving.

E. Assemblies
1. Routing of sprinkler irrigation lines as indicated on the drawings is diagrammatic. Install lines and various assemblies to conform with the details shown on drawings and in accordance with the manufacturer's recommendations.
2. Install no multiple assemblies on plastic lines. Provide each assembly with its own outlet.
3. Install all assemblies specified herein in accordance with respective detail. In absence of detail drawings or specifications pertaining to specific items required to complete work, perform such work in accordance with best standard practice with the prior approval of the Owner's Representative.
4. PVC pipe and fittings shall be thoroughly cleaned of dirt, dust and moisture before installation. Installation and solvent-welding methods shall be recommended by the pipe and fitting manufacturer. Primer shall be used on all solvent weld joint. No solvent weld joint shall be submitted to water pressure until curing for 24 hours minimum.
5. On PVC to metal connections, the Contractor shall work the metal connections first. Teflon paste shall be used on all threaded PVC to PVC joints, and on all threaded PVC to metal joints. Light wrench pressure is all that is required. Where threaded PVC connections are required, use threaded PVC adapters into which the pipe may be welded. Teflon tape shall not be accepted.
6. Gasket pocket pipe and fittings shall be assembled in strict accordance with the manufacturer's recommendations. Only recommended lubricant will be permitted.

F. Concrete thrust blocks
1. Installed at specific locations per manufacturer's recommendations and instructions. Thrust blocks shall be installed for main lines at all changes in direction, tees, and gate valves.

G. PVC Pipe Installation:
1. Piping shall be snaked in the trench to allow for thermal expansion and contraction.
2. After all curing of solvent weld joints and after having received the approval of the Owner's Representative, the mainline shall be filled. Extreme care will be taken to slowly fill the piping while releasing entrapped air at the ends of the main line.
3. All lines shall have a minimum clearance of six inches from each other, and from lines of other trades. This clearance shall not supersede any clearance required by local, regional or national building, health or safety codes. Parallel lines shall not be installed directly over one another.
4. Manufacturer's installation recommendations shall be strictly adjured to.

H. Flushing of System
1. After all new sprinkler pipe lines and risers are in place and connected, all necessary diversion work has been completed, and prior to installation of sprinkler, heads, the control valves shall be opened and a full head of water used to flush out the system.
2. Sprinkler shall be installed only after flushing of the system has been accomplished to the complete satisfaction of the Owner's Representative.

I. Temporary Repairs
1. The Owner reserves the right to make temporary repairs as necessary to keep the sprinkler system equipment in operating condition. The exercise of this right by the Owner's Representative shall not relieve the Contractor of his responsibilities under the terms of the guarantee as herein specified.

J. Pressure Regulator
1. Install in a valve box in conformance with the project details.

K. Emitter Assembly
1. The emitter and distribution tubing shall be assembled using the manufacturer's recommended tools and accessories.
2. The maximum length of the .22" distribution tubing shall be 8'. In the event the distance in the field exceeds the maximum length, the Contractor shall extend the poly tubing as required by adding a tee and shall add a hose end cap to this extension at the Contractor's expense.
3. The Contractor shall assemble the emitter assembly in conformance with the applicable detail on the project plans.

L. Emitter Hose
1. The emitter hose location, as shown on the plans, is diagrammatic. The Contractor shall layout this hose so as to conform to the maximum distance requirements as specified under the emitter assembly section of these specifications.
2. The Contractor shall flush the emitter hose prior to and after installation of the emitter assemblies.

3.06 FIELD QUALITY CONTROL

A. Adjustment of the system
1. The Contractor shall flush and adjust all sprinkler heads for optimum performance and to prevent, as much as possible, over spray into walks, roadways and buildings.
2. If it is determined that adjustment in the irrigation equipment will provide proper and more adequate coverage, the Contractor shall make such adjustments prior to planting. Adjustments may also include changes in nozzle sizes and degrees of arc as required. Such changes shall be approved in advance by the Owner's Representative, at no cost to the Owner.
3. Lowering raised sprinkler heads by the Contractor shall be accomplished within 10 days after notification by the Owner.
4. All sprinkler heads shall be set perpendicular to finished grades unless otherwise designated on the plans. On slopes, heads shall be angled for optimum coverage and performance.
5. Owner's Representative to approve all head locations and reserves the right to request the contractor to make minor adjustments to head placement or nozzle selection at no cost to the Owner.
6. All parts of the irrigation system and associated equipment shall be adjusted to function properly and shall be turned over to the Owner in operating condition.

B. Testing of the Irrigation System
1. The Contractor shall request the presence of the Owner's Representative at least 48 hours in advance of testing.
2. Test all pressure lines under hydrostatic pressure of 150 lbs. per square inch and prove water tight.
3. All piping under paved areas shall be tested under hydrostatic pressure of 150 lbs. per square inch and proved water tight prior to paving.
4. All PVC lateral line pipe shall be tested at working line pressures with coupling exposed and swing joints and other outlets capped.
5. Sustain pressure in the lines for not less than two hours. Pipe sections shall be center loaded and all coupling shall be exposed. Before testing, the line shall have been filled with water for at least four (4) hours and provisions made for thoroughly bleeding the line of air.
6. All hydrostatic tests shall be made only in the presence of the Owner's Representative. No pipe shall be backfilled until it has been inspected, tested and approved in writing.
7. Furnish necessary force pump and all other equipment necessary to perform test.
8. When the sprinkler irrigation system is completed, perform a coverage test in the presence of the Owner's Representative to determine if the water coverage for the planting areas is complete and adequate. Furnish all materials and perform all work required to correct any inadequacies of coverage due to deviations from plans or where the system has been willfully installed as indicated on the drawings when it is obviously inadequate without bringing this to the attention of the Owner's Representative. This test shall be accomplished before any planting or turf has been installed.
9. Upon completion of each phase of work, entire system shall be tested and adjusted to meet site requirements.

3.07 MAINTENANCE

A. The entire irrigation system shall be under full automatic operation for a period of seven days prior to planting.

B. The Owner's Representative reserves the right to waive or shorten this operation period.

C. Contractor shall provide job maintenance of the entire irrigation system and shall continue until job acceptance by the Owner. Maintain all system components and assure proper watering of all plants. Repair all leaks and replace any defective components. After all landscape and irrigation operations are complete and in conformance with the contract documents, the Owner shall grant provisional acceptance.

D. Following provisional acceptance, the Contractor shall provide job maintenance for 365 days consisting of all items covered under maintenance. Following the 365 day maintenance period, the Owner shall grant final job acceptance after verifying all work and system components are in conformance with the Contract Documents.

3.08 CLEANUP

A. Cleanup shall be made as each portion of work progresses. Refuse and excess dirt shall be removed from the site, all walks and paving shall be broomed or washed down, and any damage sustained to the work of others shall be repaired to the original conditions acceptable to the Owner's Representative.

3.09 FINAL OBSERVATION PRIOR TO ACCEPTANCE

A. The Contractor shall operate each system in its entirety for the Owner's Representative at the time of final observation. Any items deemed not acceptable shall be reworked to the complete satisfaction of the Owner's Representative.

B. The Contractor shall show evidence to the Owner's Representative that the owner has received all accessories, charts, record drawings, and equipment as required before final observation can occur.

3.10 OBSERVATION SCHEDULE

A. Contractor shall be responsible for notifying the Owner's Representative in advance for the following observations according to the time indicated:
Pre-job conference - 7 days
Pressure supply line installation and testing - 48 hours
Automatic controller installation - 48 hours
Control wire installation - 48 hours
Lateral line and rtor/spray installation - 48 hours
Coverage test - 48 hours
Final observation - 7 days

B. When the inspections have been conducted by other than the Owner's Representative, show evidence and by whom these inspections were made.

C. No observation shall commence without as-built drawings.
1. In the event the Contractor calls for an observation without as-built drawings, without completing previously noted corrections, or without preparing the system for observations, he shall be responsible for reimbursing the Owner's Representative at the hourly rate in effect at the time of the observation, portal to portal (plus transportation cost) for the inconvenience. No further inspections will be scheduled until this charge has been made. Delays in schedules caused by Contractor's non payment of these charges shall not be grounds for extension of the construction schedule.

END OF SECTION 32 84 23

SECTION - 32 90 00 PLANTING

PART 1 - GENERAL

1.01 SUMMARY

A. Work in this section includes complete landscape and planting as shown on the drawings and as specified herein. Work includes but is not limited to:
1. Salvage, transplanting, nursery care, and maintenance of existing plant materials.
2. Contract growing of plant material.
3. Storage and handling of plant material.
4. Soil preparation.
5. Finish grading.
6. Planting.
7. Staking and guying.
8. Watering.
9. Maintenance

1.02 QUALITY ASSURANCE

A. All work under this section shall be done by a licensed landscape contractor with a minimum of 5-years experience in Southern Arizona working on native landscape restoration projects for Owner agencies. Contractor shall submit documentation showing completion of 3 similar projects with references.

B. The Applicator of weed control materials shall be licensed by the State of Arizona as a pest control operator and a pest control advisor in addition to holding any sub-contractor licenses that are required.

C. Schedule a Pre-Construction Conference with owner representative at least seven days before beginning work under this section. Purpose of this conference is to clarify construction documents and review questions the Contractor may have regarding the Work Administrative Procedures during Construction and Project Work Schedule.

D. All notifications made to the owner representative and/or General Contractor shall also be made to the Architect.

E. Schedule all necessary site meetings for clarification of intent.

1.03 REFERENCE

A. Uniform Standard Specifications for Public Works Construction, Maricopa Association of Owners (MAG).

B. American Standard For Nursery Stock Ansi Z60.1-2004.

C. All notifications made to the owner representative and/or General Contractor shall also be made to the Architect.

D. State of California Grading Code of Nursery Stock #1 Grade.

E. A.N.A. (Ariz. Nurseryman's Association) Tree Specifications.

1.04 SEQUENCING

A. Do not commence work of this Section until work of Sections 32 84 23 Irrigation System and Grading have been completed and approved.

1.05 SUBMITTALS

A. Contractor qualifications

B. Product Data:
1. Plant Material - Submit Spread Sheet with following information: Scientific and Common Name, Container Size, Quantity and Nursery Supplier(s). Photo Log - Individual Plant Cut sheets with photos of each species including scientific and common names from Plant Legend and Hydro-seed Mix.
2. Recycled Content:
a. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
b. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
c. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
3. Local/Regional Materials:
a. Sourcing location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
b. Manufacturing location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
4. Biobased materials:
a. Indicate type of biobased material in product.
b. Indicate the percentage of biobased content per unit of product.
5. Compost:
a. Evidence of certification under the U.S. Composting Council (USCC) Seal of Testing Assurance (STA) Program.
6. Prior to the installation of any weed control materials, submit to the owner representative a list of the Weed control Materials and quantities per acre intended for use in controlling the weed types prevalent and expected on the site. Furnish data to demonstrate the compatibility of the weed control materials and methods with the intended planting and seeding varieties, including weed control labels.
7. Submit list of hydroseeding materials and methods.

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811
Call 811 or click Arizona811.com

REGISTERED LANDSCAPE ARCHITECT
CERTIFICATE NO.
39813
ERIC R. BARRETT
04/21
Date Signed
ARIZONA, U.S.A.

EXPIRES 9/30/2021

SCALE AS NOTED
APRIL 2021

ARC STUDIOS
3117 E. Flower Street
Tucson, Arizona 85716
phone: 520.882.9655
www.arcstudiosinc.com
landscape architecture . urban design
environmental services . irrigation design

ARC STUDIOS PROJECT NO: 01-20078

LANDSCAPE SPECIFICATIONS DEVELOPMENT PACKAGE

FOR

TEP PATRIOT SUBSTATION

PARCEL TBD
LOCATED IN NE 1/4 OF SECTION 31, T 14 S, R 15 E, G&SRM,
CITY OF TUCSON, PIMA COUNTY, ARIZONA

DP ___

REF: T21SE00006
COT ADMINISTRATIVE ADDRESS:
6980 EAST ESCALANTE ROAD
TUCSON, ARIZONA 85707

REVISIONS

DATE	ENG	TECH	REV

DESCRIPTION:
ISSUED FOR CONSTRUCTION
PAT SUB DEV PLAN
JOB No. 10449.00 / WO 6297641

TUCSON ELECTRIC POWER
3950 E IRVINGTON RD.
TUCSON, AZ 85714
ATTN: JESUS MARTINEZ
520-396-2551

VENDOR

NAME: DRAWING #: SHOP ORDER #: TEP PO #:

AUTOCADD

Tucson Electric Power Company
TUCSON, ARIZONA

TITLE: SITE DEVELOPMENT LANDSCAPE SPECIFICATIONS PATRIOT SUBSTATION

TRSQ T14S,15E,S31
REF # N/A
DWG # 0398-138-04-0014
REV 00 SHEET C14

C. Submit a proposed Work Schedule to owner representative at least 30 days prior to start of work. After approval, no modification shall be made to this schedule without written authorization by owner representative.
D. Planting schedule indicating anticipated dates and locations for each type of planting.
E. Operation and Maintenance Manuals Submittals:
1. Instructions indicating procedures during one typical year including variations of maintenance for climatic conditions throughout the year. Provide instructions and procedures including:
a. Watering. Include recommendations on soil management and potential erodibility as determined per assessment under field quality control.
b. Promotion of growth, including mulching, composting, and pruning.
c. Integrated weed and pest management.
2. Pictures of planting materials cross referenced to botanical and common names. Describe normal appearance in each season.

1.06 PROJECT CONDITIONS
A. Confirm the location and identity of existing underground and overhead services and utilities within contract limit work areas with owner representative prior to excavation or digging. Provide adequate means of protection of utilities and services designated to remain.
B. When uncharted or incorrectly charted underground piping or other utilities and services are encountered during site work operations, notify the owner representative immediately to obtain procedure directions. Cooperate with the owner representative in maintaining active services in operation.
F. Locate, protect, and maintain benchmarks, monuments, control points and project engineering reference points. If said elements are disturbed or destroyed cease work and bring to the attention of the owner representative immediately.
D. Obtain owner representative's written permission when required to close or obstruct street, walks and adjacent facilities.
E. Control dust caused by the work. Dampen surfaces as required. Comply with pollution and dust control specifications.
F. Protect existing buildings, paving, and other services or facilities on site and adjacent to the site from damage caused by work operations.
G. Protect and maintain streetlights, utility poles and services, traffic signal control boxes, curb boxes, valves and other services.

1.07 WARRANTY
Special Warranty: The following warranty shall be submitted to the Owner in addition to the Warranty described in Section 00 65 36 - Contract Closeout.
1. Warrant plant material to remain alive and be in healthy, vigorous condition for a period of 1 year after completion and acceptance of entire project. Trees and shrubs replaced during the warranty period shall have a new warranty period beginning at the time of replacement.
2. Warranty shall not include damage or loss of trees, plants, or ground covers caused by fires, floods, freezing rains, lightening storms, or winds over 75 miles per hour, winter kill caused by extreme cold (Below 10 Degrees) and severe winter conditions not typical of planting area; acts of vandalism or negligence on the part of the Owner.
3. Replace, in accordance with the drawings and specifications, plants that are dead or, as determined by the owner representative, are in an unhealthy or unsightly condition, and have lost their natural shape due to dead branches, or due to the Contractor's negligence.

PART 2 - PRODUCTS
2.01 MATERIALS
A. General
1. Appropriate documentation, as specified below, shall be submitted to the owner representative a minimum of 30 calendar days before the start of a scheduled seeding activity. No materials shall be delivered to the site until the documentation has been approved by the owner representative.
2. Unless otherwise specified, Certificates of Compliance conforming to the requirements of project specifications shall be provided for all materials.
3. Unless otherwise specified, the contractor shall perform all testing, or provide test results to the owner representative from accredited laboratories.
B. Plant Material:
1. Plant material must be the species and variety as shown on the plans or as specified herein. No plant substitutions will be accepted. It is the contractor's responsibility to procure plant material in advance of planting. This may include, but is not limited to, contract growing and/or wildland harvesting.
2. Harvested or salvaged plant material must be specimens collected within 160-KM (100-miles) of the project site.
3. Container or field grown specimens must be propagated from seed, tissue culture or off-sets from a native wildland source within 160-KM (100-miles) of the project site prior to or during the contract period. All plants shall be nursery grown under climatic conditions similar to those in the locality of the project.
4. Give careful attention to planning and scheduling. Many species required by this contract may only be collected or grown during specific times of the year. Within 30 calendar days after the award of contract, the contractor shall submit the name of the growing contractor(s) to be used, along with written confirmation from suppliers, on their letterhead, that the source(s) for the contract specified plant material has been secured. If any of the contract-specified plant material is expected to not be available during the contract period prior to planting, in accordance with Subsection 2.02(C) below, the contractor shall notify the owner representative at this same time.
5. Plants shall be quality material having the habit of growth which is normal for the species; sound, vigorous, health, free from insects, plant diseases and injury. Can, ball, height and spread dimensions shall be measured according to specified standards and good practice.
6. Container plants shall have been in the containers for sufficient length of time for the root system to hold the earth when taken from the container, but not long enough to become root-bound or cause "Hardening-Off". Heeled-in stock or stock from cold storage is not acceptable. Plants cutback from larger sizes to meet specifications will not be acceptable.
7. Plant names shall conform to those given in "Standardized Plant Names" latest edition, prepared by the American Committee on Horticultural Nomenclature, or are names generally accepted trade.
8. Select, dig, transport, protect and plant in accordance with the requirements of these specifications and "American Standards for Nursery Stock" in effect on date of invitation, and accepted good practice.
9. Certificates shall accompany shipments as proof of inspection and quality as may be required by Federal, State or other authorities. Each shipment shall be declared free of disease and insects of any kind. Label each plant or bundle and deliver bulk materials in sealed, labeled bags, testifying as to percent of purity of contents.
10. Should any conflict arise as to the quality of any plant materials, the decision of the owner representative is final.
11. Quality of plants shall conform to the State of California Grading Code of Nursery Stock #1 Grade, and be full sized. They shall be vigorous, or normal growth, free of disease, insects and latent defects.
12. All trees to meet or exceed the A.N.A. Ariz. Nurseryman's Association specifications.

C. Plant Substitution: No substitution of the contract-specified plant material will be allowed.
D. Topsoil: Topsoil shall be screened, fertile, friable soil from well drained arable land within 50 miles of the project site and free from nut grass, refuse, roots, heavy clay, noxious weeds or any material toxic to plant growth. Top soil shall conform to the requirements of MAG Uniform Standard Specifications Sections 425 and 795 except that pH factor shall not be greater than 8.0. Topsoil contents shall be as follows: Silt 20-45%, clay 15-20%, sand 30-60%, with a minimum of 5% organic material (natural or added). Topsoil existing in the site may be used if it meets the above specification. pH shall not be lower than 5.5 nor exceed 8.0 and soluble salts shall not exceed 1500 PPM.
E. Fertilizer: No fertilizer shall be used for native plants. Refer to section K- Enriched Soil Mix- for fertilizer requirements for exotic plants.
F. Water: Water shall be free of oil, acid, salts or other substances which are harmful to plants. The source shall be as approved by the owner representative prior to use.
G. Compost- The composition of compost and the amount to be used on this project shall be determined by the owner representative based upon soil analysis to be completed following completion of earthwork and grading operations. For bidding purposes compost shall be the kind hereafter specified.
1. Compost shall consist of composted organic vegetative materials. Prior to being furnished on the project, compost mulch samples shall be tested for the specified microbiological and nutrient conditions, including maturity and stability, by a testing laboratory approved for testing of organic materials. Written test results shall be submitted to the owner representative for approval.
2. Compost material shall be dark brown in color with the parent material composted and no longer visible. The structure shall be a mixture of fine and medium size particles and humus crumbs. The maximum particle size shall be within the capacity of the contractor's equipment for application to the constructed slopes. The odor shall be that of rich humus with no ammonia or anaerobic odors.
3. Product Parameters: Provide compost products certified in accordance with the U.S. Composting Council (USCC) Seal of Testing Assurance (STA) Program. Compost shall meet the requirements of Table 3:

TABLE 3

Caption Exchange Capacity (CEC)	Greater than
50meq/100g Carbon:Nitrogen Ratio	Less than 20:1
pH (of extract)	6.0 - 8.5
Organic Matter Content	Greater than 25%
Total Nitrogen (not added)	Greater than 1%
Humic Acid	Greater than 5%
Maturity Index	Greater than 50%
maturity Index at a	10:1 ratio
Stability	Less than 100 mb 02/Kg compost dry solids - hour

H. Soil Conditioners: Soil conditioners, when required, will be as shown in the Special Provisions.
I. Mulch: Mulch shall be organic composted ground or shredded fir or pine bark or shavings, max. pH 7.5, 85% passing a one-quarter inch screen, hygroscopic or containing a wetting agent, 1% min. nitrogen stabilized. Wood fiber mulch shall be in uniform weight with the unit weight displayed clearly on each package. Fiber shall be dyed green in color to provide visual metering of application. Tackifier shall be incorporated into the wood fiber in the drying process. Percentage of Tackifier shall not be less than 2% or greater than 10%, with the percentage used clearly labeled on outside of package. Tackifier rates shall be adjusted by adding woodfiber mulch with Tackifier and regular woodfiber mulch to provide Tackifier rates equivalent to or greater than specified.
J. Soil Sulfur: Soil Sulfur shall be organic granular or prilled agricultural grade, 99.5% sulfur.
K. Enriched Soil Mix
1. Prepared soil for backfill of exotic trees and shrubs in landscape areas or raised planters identified on planting plans shall consist of a mixture of one part approved soil conditioner and one part clean sand, to two parts top soil as described in these specifications. Soil conditioner shall consist of composted, ground or shredded fir or redwood having a pH not exceeding 7.5 minimum total nitrogen 1 percent, organic matter not less than 85 percent, 85 percent passing a 6.35 mm [1/4 inch] screen and shall contain a wetting agent to be hydroscopic or Humus containing 98% centrifuged digested sewable sludge and composted to support bacterial cultures such as "Nitrohumus" or Kellogg or "GrowPower" by So. Cal. Organic Fertilizer Co. Prepared soil shall be mixed as herein specified prior to being placed in the planting pits. The Contractor shall notify the Architect prior to mixing prepared soil so that he may observe the blending process. Add one pound of gypsum and four ounces of soil sulfur per shrub. Mix well along with conditioner as noted herein.
2. All plant material identified as “exotics” in the landscape legend on plans and details with the exception of Ground Covers in flats and Turf areas to receive Agriform (20-10-5) plant tabs at the following rates. Mix approved fertilizer in backfill material:

1 gallon	1 - 21 gram tablets
5 gallon	2 - 21 gram tablets
15 gallon	4 - 21 gram tablets
24” inch box	6 - 21 gram tablets
36” inch box +	8 - 21 gram tablets

Set tablets 3 inches below finished grade and space evenly around plant's perimeter.

PART 3 - EXECUTION
3.01 EXAMINATION
A. Verification of Conditions: Examine subsurfaces to receive Work and report in writing, with a copy to owner representative/Architect detrimental conditions. Failure to observe this requirement constitutes a waiver to subsequent claims to the contrary and holds Contractor responsible for correction(s) owner representative/Architect may require. Commencement of Work will be construed as acceptance of subsurfaces.
1. Verify, before proceeding with this Work, that required inspections of existing conditions have been completed.
2. Utilities and underground structures occur extensively throughout site. Become thoroughly acquainted with layout of underground utilities and structures over the entire site.
3. Verify that all excess building materials of other trades have been properly removed. Do not begin work until all planting and landscape areas have been cleared.
4. Identify areas of contaminated or over-compacted soil in landscape areas. Bring these conditions to the attention of the owner representative prior with recommendations for remediation based on project specifications prior to proceeding.

3.02 STORAGE AND HANDLING OF PLANT MATERIAL
A. Packing and shipping: When weather conditions are such that exposure to sun and wind during transit may adversely affect the health of plants, transport plant materials to site in controlled environment trailer. Use carrier experienced in handling live plants.
B. Acceptance at site: For inspection and identification purposes, the Nursery shall securely attach durable metal, legible labels stating, in weather resistant ink or stamped, the plant species and a plant number. The Owner's Representative and selected Nursery(s) shall agree on a plant numbering system, these tags shall remain on the tree at all times for the purpose of tracking a specific crop and or phase of construction. Plants are subject to inspection and approval by the Owner's Representative at the Nursery or place of contract growing and at the project site for conformance with requirements specified herein. The Owner's Representative reserves the right to inspect plants at any time during the resultant contract duration. Plants not labeled by nursery of origin shall not be accepted. Keep plants of different species and varieties separated at site.
C. Storage and Protection:
1. No long term storage of plant material is permitted on-site. Coordinate temporary receiving and holding areas for plant material delivered to site with owner representative.
2. Adequately protect plants from drying out, exposure of roots to sun, rodent and insect and from other injury.
3. If planting is delayed more than 12 hours after delivery, set plant material in shade and keep roots moist.
4. Do not remove container grown stock from containers until planting time.
5. Protect from deterioration during delivery and while stored at site.
6. Do not hold plants in location with adverse environmental conditions.

3.03 PREPARATION
A. Protection: Existing plant material to be preserved in place must be protected to insure survival.
B. Existing trees and vegetation must be maintained by an automatic or manual irrigation system while project is under construction. It is the General Contractor's responsibility to protect and maintain existing trees before the Landscape subcontractor is on site to install the landscaping. Trees and other vegetation that is removed or dies during construction must be replaced with specimens of the same variety and height, width and caliper at no expense to the Owner and the vegetation shall be treated as new landscape material for purposes of warrantee and guarantee.

3.04 GRADING
A. Insure that all site grading include water harvesting depressions and berming has been completed and accepted.
B. Refer to section 32 92 19 Hydraulic Seeding for requirements in areas of revegetation and seeding.
C. Bring planting areas to finish grade after soil prepping which shall be 2 inch minimum below paving and curbs or a as noted by spot elevations or details and lawn areas shall slope from walk, curb or buildings. Special attention shall be given to maintaining continuous and even flowlines, drainage away from structures, and providing overall positive drainage to inlets and outlets.
D. Grades shall be established to drain water away from structures and behind walls. When drainage is difficult to achieve, notify the owner representative and request a solution before continuing. Grades in shrub areas shall be established prior to planting to insure proper final planting heights. Final grading shall include the knocking down of watering basins prior to planting of ground cover. On hillside planting water basins shall be retained.
E. Irrigation sprinkler heads shall be raised to the proper heights as detailed after grading and prior to planting operations.
F. Finish grade tolerance shall be plus or minus 0.1 of a foot. Finished grade shall generally be 2 inches below adjacent walks or curbs and will take the forms shown on the Drawings Accepting any import soil as being in conformance with the specified in these documents. Should conflict arise, call owner representative for instructions.

3.05 TOPSOIL
A. Topsoil shall be spread over prepared sub-grade to such a depth that after area has been compacted and planted the surface shall conform to grades and landforms designated on plans and in specifications.
B. Import soil shall match the native soils texture, density and particle size. Backfill mix shall be prepared at one time at a controlled location on the site. Mixing of amendments with a tractor driven rototill at the site is an acceptable method of blending backfill.
C. After topsoil has been spread, the area shall be raked to remove additional stones, roots, lumps or any other foreign material. In groundcover and other planting areas, remove grass, grass roots and weeds in existing or imported topsoil. The finished surface shall be loose, smooth and pulverized. Repair tire ruts created by vehicles and equipment. Area of repair shall be blended and floated to match surrounding areas.

3.06 PLANTING
A. Time of planting: Confirm seasonal planting requirements with supplier and landscape architect. Plant deciduous materials in a dormant condition. If deciduous trees are planted in- leaf, they shall be sprayed with an anti-desiccant prior to digging operation. Do not plant evergreen or herbaceous plant material when temperatures are below freezing.
B. Layout and Staking: Stake plant locations and obtain approval from the owner representative before excavating pits, making necessary adjustments as directed. Plants not dimensioned as to precise locations shall be scaled from the drawings and the plant placed in the appropriate relationship indicated.
C. Planting pits: Planting pits must conform to the construction details and meet the minimum requirements of two times the diameter of the root ball and a minimum of 6 inches deeper.
D. Plant placement: Carefully place plants in holes. Remove container so as not to disturb rootball. Plant material shall be planted sufficiently deep to cover roots and level with adjacent finish grade or as shown in details.
E. Backfill: Backfill shall be added around root ball of plant until the backfill is half-way up the root ball, then the hole shall be watered sufficiently to settle the backfill around the root ball. More backfill shall be added and be firmed sufficiently to force air pockets form each hole, Immediately after planting, each plant shall be thoroughly watered.
F. No boxed, balled or canned plants shall be planted if the ball is broken, cracked or rootbound, whether before or during the process of planting. Any trees transplanted that die or have bark, branch or die back injury, shall be replaced with equal trees approved by the Architect at no expense to the Owner.
G. Groundcover plants shall have been grown in flats, cans or pots and shall remain in those flats, cans or pots, until transplanted. At time of transplanting, the flat soil shall contain sufficient moisture so that the soil does not fall apart when lifting plants from the flat. Each plant from a flat shall be planted with its proportionate amount of the flat soil in a manner that will insure a minimum disturbance to the root system.

3.07 STAKING TREES AND SHRUBS
A. Tree stakes shall be 2 inches x 2 inches x height as required redwood stake or 2 inches dia. new lodge pole pine treated with a non-toxic wood preservative approved by landscape architect. Stake as required by plant legend remarks and details. Trees over 4' in height shall be double-staked up to a caliper of 3 inches. Guy wires and short stakes shall be provided for larger trees. Taller tree stakes may be required for large trees. The landscape contractor is to supply taller stakes as required to guarantee against wind damage.

3.08 HYDROSEEDING:
(Refer to Section Hydraulic Seeding)

3.10 IRRIGATION
A. Keep irrigation controllers, valves, lines and heads clean and in good working order, and any damages during maintenance period shall be repaired at no cost to the Owner.
B. Water installed plant material daily through final project acceptance or commissioning of irrigation system.

3.09 FERTILIZING:
A. Do not apply chemical fertilizer to plant material following installation.

3.10 FIELD QUALITY CONTROL
A. Tests: The owner representative reserves the right to take and analyze samples of materials conformity to specifications at any time. Contractor shall furnish samples upon request by Architect. Rejected materials shall be immediately removed form the site and replaced.
B. Make known sources of all contract materials to allow for field inspection by the owner representative.
C. Water: Coordinate with work specified per civil documents.
D. Assess potential effects of landscape work on soil loss in accordance with ASTM D6629. Assess erodibility of soil with dominant soil structure less than 7 to 8 cm in accordance with ASTM D5852.

3.11 MAINTENANCE
A. Refer to Section 32 01 90 Operation and Maintenance of Planting and Irrigation.
B. Continuously maintain landscaped areas included in the contract during all phases of construction through Owner acceptance of complete project.
C. Provide additional landscape and irrigation maintenance for 365 days minimum from Owner acceptance of complete project. The maintenance period will be extended until the Owner has begun maintenance operations, all landscape and planting areas are free of weeds and for the time necessary to meet the requirements of the Drawings and Specifications.
D. After Work indicated or specified, including related work, has been completed, inspected, and approved, maintain planted areas by means of continuous watering, weeding, rolling, mowing, reseeding, cultivating, spraying, mulching, trimming, edging, or other operations necessary for their care and upkeep.
E. Dead plants shall be replaced during this period immediately, and as directed by the owner representative/Architect.
F. Weed Control: Remove weeds by hand as required by specifications prior to the completion of the 365 day maintenance period. Weed control shall eliminate all invasive weeds common to the area, including Bermuda grass. Identify weeds to be removed with landscape architect and/or owner representative prior to removal.
G. During the course of the Work and on completion of the Work, remove excess materials, equipment and debris and dispose of away from premises. Remove from site daily, debris generated from rotor-tilling and fine grading. Leave Work in clean condition.
H. Promptly remove soil, mulch or other materials, dropped into paved areas by hauling operations promptly, keeping these areas clean at all times. Upon completion of planting, all excess soil stones and debris not heretofore disposed of under his scope of Work shall be removed from the site or disposed of as directed by the owner representative.

3.12 COMPLETION INSPECTION
A. When Landscape Work has been completed in accordance with the Drawings and Specifications, notify the owner representative and request an inspection. If the owner representative determines the Work to be substantially complete and in conformance with the plans and specifications, the Contractor will be advised in writing. In order to be substantially complete at least the following must have been finished:
1. All fine grading as specified on grading plans.
2. A complete and operable irrigation system as specified in section Irrigation System, including adjustments in devices and a complete and acceptable watering schedule.
3. Installation of all landscape and plant material as specified herein.
4. Installation of all decomposed granite, sized rock and crushed stone as specified in section Crushed Stone Surfacing
5. Seeding and 100% coverage of seeded areas with germination to healthy growth as specified in section Hydraulic Seeding.

B. Minor pick-up items may be completed during the basic maintenance such as:
1. Reseeding of bare spots.
2. Replacement of damaged or non-conforming plant material.
3. Re-staking or tying of trees.
4. Removal of watering basins.
5. Filling of settled areas caused by application of normal watering.

C. The Contractor shall maintain landscaped areas on a continuous basis as they are completed during the course of Work and until final project acceptance or the termination of the plant establishment period, whichever occurs later. Maintenance shall include keeping the landscape areas free of debris, weeding and cultivating the planted areas at intervals acceptable to the Architect. The Contractor shall provide adequate personnel to accomplish the required maintenance. Pruning and restaking of plants shall be as directed by the Architect.
D. At the end of 365 days minimum and when ground covers and turf have become established and pick-up items have been completed, request a final inspection. Within 6 days the Contractor will be advised by the Architect in writing that work is or is not satisfactory.
E. If the work is satisfactory, the basic maintenance period will end. If the work is unsatisfactory the basic maintenance period will continue until the work has been completed, inspected and approved by the owner representative.

END OF SECTION 32 90 00

SECTION 32 91 19 - LANDSCAPE GRADING

PART 1 - GENERAL
1.01 SUMMARY
A. Related Sections

PART 2 - PRODUCTS
A. Not Used.

PART 3 - EXECUTION
3.01 PERFORMANCE
A. The intent of the grading plans is to provide concepts for the shaping and contouring operations within the site and to guide the Contractor in his supervision of the work. Any necessary sketches and/or detail plans will be furnished prior to or during the shaping operation. The Contractor shall shape the site areas in general conformance with the project plans. This shaping shall be done so low spots will provide passive water harvesting at depressions in all landscape and provide minor retention of stormwater.
B. It is the intent of the Owner that the finished site will be a well-drained with the proposed basins, gravel trenches and sumps. Additional swales and depressions shall be provided over and above those shown on the plans. No slopes shall be steeper than 4:1.
C. The Contractor shall expect that the shaping will be accomplished by machine and then hand worked as directed by the Owner's representative.
D. Berms and swales shall be constructed in the approximate locations as shown on the grading plan. The invert of the swales shall be deep enough to intercept surface water and to direct it to the nearest catch basin or drainage outlet. Contractor shall set all rough grading at or below inverts to allow for top dressing materials. Swales shall be graded smoothly so as to permit ease of maintenance. All areas within the limit of work shall be graded to a smooth condition compatible with surrounding areas.
E. Site shaping and contouring is an integral part of the overall project. Site shaping shall be completed and accepted by the design time prior to start of any irrigation, landscape or top dressing materials. The Contractor must coordinate his work schedule and work in accordance with the Owner's Representative's directions and instructions.
F. Attention must be paid to minimized ponding to landscape areas 10' minimum away from the building for passive water harvesting elements.
G. In order to accomplish the work in a most aesthetic manner, the Owner's Representative reserves the right to modify the grading and the shaping. These adjustments will be to create undulations, transitions and surface formations. The adjustments do not include the grading shown on the project plans. This work shall be done after all site grading is completed and reviewed for performance of intended drainage and water retention.
H. Remove from site rocks larger than 2 inches in size and foreign matter such as building rubble, wire, cans, sticks, concrete, etc.
I. Slope grade away from building for 5 feet minimum from walls at slope of X% minimum as indicated on the civil plans unless otherwise directed.

END OF SECTION 32 91 19

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811
Call 811 or click Arizona811.com

REGISTERED LANDSCAPE ARCHITECT
39813
ERIC R. BARRETT
04/21
Date Signed
ARIZONA, U.S.A.
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ARC STUDIOS PROJECT NO: 01-20078

LANDSCAPE SPECIFICATIONS DEVELOPMENT PACKAGE

FOR

TEP PATRIOT SUBSTATION

PARCEL TBD
LOCATED IN NE 1/4 OF SECTION 31, T 14 S, R 15 E, G&SRM,
CITY OF TUCSON, PIMA COUNTY, ARIZONA

DP ___

REF: T21SE00006
COT ADMINISTRATIVE ADDRESS:
6980 EAST ESCALANTE ROAD
TUCSON, ARIZONA 85707

REVISIONS

DATE	ENG	TECH	REV

DESCRIPTION:
ISSUED FOR CONSTRUCTION
PAT SUB DEV PLAN
JOB No. 10449.00 / WO 6297641

TUCSON ELECTRIC POWER
3950 E IRVINGTON RD.
TUCSON, AZ 85714
ATTN: JESUS MARTINEZ
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VENDOR

NAME: | DRAWING #: | SHOP ORDER #: | TEP PO #:

AUTOCADD

Tucson Electric Power Company
TUCSON, ARIZONA

TITLE: SITE DEVELOPMENT
LANDSCAPE SPECIFICATIONS
PATRIOT SUBSTATION

TRSQ T14S,15E,S31
REF # N/A
DWG # 0398-138-04-0015
REV 00
SHEET C15

SECTION 32 92 19 - HYDRAULIC SEEDING

PART 1 - GENERAL

1.01 SUMMARY

A. The work under this item shall consist of furnishing all materials, preparing the soil, applying seed, and establishing the seeded areas.

B. Areas to be seeded are those disturbed or unvegetated areas shown on the landscape plans, or designated by the owner representative.

C. Soil Test and analysis for recommended amendments. Contractor shall gather soil samples and have tested for recommended amendments to hydro-seed slurry.

1.02 QUALITY ASSURANCE

A. All work under this section shall be done by a licensed erosion control contractor with a minimum of 5-years experience in Southern Arizona. Contractor shall submit documentation showing completion of similar projects with references.

1.03 SEQUENCING

A. Do not commence work of this Section until work of Sections 32 84 23, and 32 90 00 have been completed and approved.

PART 2 - PRODUCTS

2.01 MATERIALS

A. General

1. Appropriate documentation, as specified below, shall be submitted to the owner representative a minimum of 30-calendar days before the start of a scheduled seeding activity. No materials shall be delivered to the site until the documentation has been approved by the owner representative.
2. Unless otherwise specified, Certificates of Compliance conforming to the requirements of project specifications shall be provided for all materials.
3. Unless otherwise specified, the contractor shall perform all testing, or provide test results to the owner representative from accredited laboratories.

B. Seed

1. The species, variety, and strain of seed shall be as shown on the plans or as specified herein. The contract specified seed shall be obtained from seed suppliers through harvesting of wildland collections, collected within 160-KM (100-miles) of the project site, or field grown seeds, grown within 160-KM (100-miles) of the project site prior to or during the contract period.
2. Species specified may only be collected or grown during specific times of the year. Within 30 calendar days after the award of contract, the contractor shall submit the name of the seeding subcontractor to be used, along with written confirmation from seed suppliers and collectors, on their letterhead, that the source(s) for the contract specified seed has been secured. If any of the contract-specified seed is expected to not be available during the contract period prior to seeding, in accordance with Subsection 2.02(C) below, the contractor shall notify the owner representative at this same time.
3. The seed shall be delivered to the project site unmixed in standard, sealed, undamaged containers for each seed species.
   a. Each container shall be labeled in accordance with the appropriate provisions of the Arizona Revised Statues and the U.S. Department of Agriculture rules and regulations under the Federal Seed Act. Labels shall indicate the variety or strain of seed, the percentage of germination, purity and weed content, the date of analysis which shall not be more than nine months prior to the delivery date, and testing information.
   b. A Certificate of Analysis from an accredited seed-testing laboratory shall accompany each container of seed. Contractor shall also furnish owner representative with proposed bulk seed rate to comply with PLS seeding rates.
4. Unless otherwise approved by the owner representative, weed content of the contract-specified seed mix shall not exceed 0.5%.
5. Contractor shall store seed under dry conditions, at temperatures of between 2° C and 48° C (35° F and 120° F), and out of direct sunlight. Prior to using the seed, the contractor shall provide a certification letter to the owner representative that the seed was stored as specified herein.
6. Legume seed shall be inoculated with appropriate bacteria cultures approved by the owner representative, in accordance with the culture manufacturer's instructions.
7. Tetrazolium staining shall be acceptable to test for germination and hard seed. Cut or fill testing will not be allowed. As directed by the owner representative, seeds with an expiration date past the acceptable test date or not meeting the specified conditions for storage shall be retested by contractor. The owner representative may perform random sampling of seeds throughout the project. Mixing of the specified seed at the project site shall be under the supervision of the owner representative.
8. Application rates of seed as specified are for Pure Live Seed (PLS). PLS is determined by multiplying the sum of the percent germination of seeds, including hard or dormant seeds, by the percent purity.
9. Seed mix species and Pure Live Seed (PLS) rates per plans

C. Seed Substitution:

1. No substitution of the contract-specified seed will be allowed unless substantial and sufficient evidence is submitted documenting that contractor has made a diligent effort to obtain the contract-specified seed from all available sources and the contract-specified seed will not become available prior to the time specified for seeding in Contractor's approved construction schedule.
2. Should a substitution of the contract-specified seed be requested for the reason specified above, and the contractor's documentation is approved by the owner representative an alternate seed will be specified within five working days of the owner representative's approval of the contractor's documentation.
   a. The alternate seed will only be allowed when there is an insufficient quantity of the contract-specified seed, as determined in the previous paragraph, for the areas to be seeded as called for herein or as required for erosion control.
   b. The contractor shall obtain and apply the alternate seed, as required, to all such remaining areas. Unless otherwise approved by the owner representative, the approved alternate seed will only be allowed until such time that contract_specified seed meeting the availability and price requirements specified herein can be provided.

D. Chemical Fertilizer and Sulfur: The composition of chemical fertilizer and the amount to be used on this project shall be determined by the owner representative based upon soil analysis as outlined in section 3.03 (B), to be completed following completion of earthwork and grading operations. For bidding purposes Chemical fertilizer shall be the kind hereafter specified.

1. Fertilizer shall be composed of a mixture of one part sulfur-coated urea 25-4-8, one part monammonium phosphate 11 52 0, and one part methylene urea 38-0-0.
2. The sulfur-coated urea, a blended fertilizer 25-4-8, shall have 80% of the nitrogen defined as slow release, and contain 5 percent Iron, 10% sulfur and trace amounts of zinc and manganese.
3. The resulting 24-18-2 chemical blended fertilizer, as specified herein, shall be applied at the rate of 200-pounds per acre.
4. In addition to the fertilizer mixture, agricultural sulfur compounds, comprised of between 80% and 96% sulfur, shall be applied at the rate of 300-pounds per acre.

E. Water: Water shall be free of oil, acid, salts or other substances which are harmful to plants. Water source shall be tested. Sample from source shall be evaluated for PH and chemical content. Contractor shall include additional amendments to offset high salt or other mineral contain impacting hydro-seed germination. The source shall be as approved by the owner representative prior to use.

F. Following completion of soil analysis, and prior to final tillage, Compost shall be applied as required to areas to be seeded at the rate per acre specified for incorporation into the soil seedbed in accordance with section 3.03 (C). For purposes of bidding, and unless otherwise specified, compost shall be applied to areas to be seeded at the rate of 9.2 cubic meters (12 cubic yards) per acre, or 20% by volume of depth of tilled soil, (whichever is greater) prior to final tillage for incorporation into the soil seedbed.

G. Soil Conditioners: Soil conditioners, when required, will be as shown in the Special Provisions.

H. Mulch: Mulch shall be composted ground or shredded fir or pine bark or shavings, max. pH 7.5, 85% passing a one-quarter inch screen, hygroscopic or containing a wetting agent, 1% min. nitrogen stabilized. Wood fiber mulch shall be in uniform weight with the unit weight displayed clearly on each package. Fiber shall be dyed green in color to provide visual metering of application.

1. Tackifier shall be incorporated into the wood fiber in the drying process. Percentage of Tackifier shall not be less than 2% or greater than 10%, with the percentage used clearly labeled on outside of package.
2. Tackifier rates shall be adjusted by adding wood fiber mulch with Tackifier and regular wood fiber mulch to provide Tackifier rates equivalent to or greater than specified.

I. Soil Sulfur - Soil Sulfur shall be granular or prilled agricultural grade, 99.5% sulfur.

J. Tacking Agent - Tacking agent shall contain a plantago organic muciloid base, with the active ingredient comprising 70-80% of the agent. The plantago organic muciloid base shall meet the following standards:

Moisture	Less than 9%
Ash	Less than 3%
Swell Volume	40 ml/gr
Muciloid purity	75%

PART 3 - EXECUTION

3.01 GENERAL

A. Submit recommended amendment and slurry mix from hydro-seed company and soil supplier based on soil test results.

B. The contractor shall notify the owner representative at least two weeks prior to commencing seeding operations.

C. The equipment and methods used to distribute seeding materials shall provide an even and uniform application of seed, mulch, and other materials at the specified rates.

D. Unless specified otherwise in the Special Provisions, seeding operations shall not be performed on undisturbed soil outside the clearing and grubbing limits of the project, in areas of undisturbed native landscape on site or on steep rock cuts.

E. Seeding shall be done during suitable weather and soil conditions for tillage and placement of materials. Seeding operations shall not be performed when wind would prevent uniform application of materials or would carry seeding materials into areas not designated to be seeded.

3.02 PROTECTION

A. Take care and precautions in work to avoid conditions which will create hazards. Post signs or barriers as required. Refer to plans for limits of construction and location of construction and safety fencing.

B. Provide adequate means for protection from damage through excessive erosion, flooding, heavy rains, etc. Repair or replace damaged areas.

3.03 SURFACE PREPARATION

A. Following completion of grading operations, contractor will take soil samples from landscape areas throughout the site and have samples analyzed by a certified soils testing laboratory. The laboratory shall be instructed to make recommendations for soil amendment to achieve optimum soil composition for the establishment of native shrubs, forbes and grasses. Test results, with recommendations for soil amendment will be reviewed by owner representative.

B. Following review of soil analysis and recommendation for improvement the contractor shall provide a revised schedule of proposed fertilizer and soil amendments to be used in seeding operations for review by owner representative.

C. Tillage

1. Where equipment can operate, the area to be seeded or planted shall be prepared with a ripper bar, chisel plow, or with other devices, which will provide thorough soil cultivation to a depth of 6 inches.
2. On cut and fill slopes the operations shall be conducted in such a manner as to form minor ridges of thereon to assist in retarding erosion and favor germination of the seed.
3. Care shall be taken during the seeding operations to prevent damage to existing trees and shrubs in the seeding area in accordance with the requirements of general project specifications.
4. Tillage may require passing the equipment over the area several times to provide thorough soil cultivation. Furrows from tillage shall be no more than 8 inches apart. No work shall be done when the moisture content of the soil is unfavorable to tillage.
5. All areas prepared with tilling shall have fertilizer and compost uniformly applied and incorporated into the soil at the specified rates per acre with final tillage and seeding. Slopes 3:1 and flatter shall have fertilizer and compost tilled into a minimum of the top four inches of the surface. Slopes steeper than 3:1 shall have fertilizer, soil amendments, and compost applied for incorporation into the soil as directed by the owner representative.

3.04 SEEDING:

A. General:

1. Hydroseeding shall be method for seed distribution.
2. Wood fiber mulch shall be applied on hydroseeded areas by tacking, as specified herein or directed by the owner representative.

B. Hydroseed Method:

1. Hydroseeded with wood fiber mulch applied following application of the seed. The contract specified seed shall be applied in a slurry containing a minimum of 40 pounds tacking agent and 200 pounds of wood fiber mulch per acre. Seed shall not be in the slurry for more than 30 minutes. Seed planted by this method will not require covering with soil. Soil areas shall be tilled to produce loose and friable surfaces with crusted hard soils broken up prior to hydroseeding.

C. Anchorage by Tacking:

1. Slurry consisting of a minimum of 68 KG (150 pounds) of tacking agent, 226 KG (500 pounds) of wood fiber mulch, and 300 gallons of water per acre. The contractor may increase the quantities of components to ensure the stability of the straw mulch to provide erosion control during the 90 calendar-day maintenance period at no additional cost to the Owner.

3.06 APPLYING WOOD FIBER MULCH WITH TACKING AGENT:

A. Areas seeded but not practical for straw mulch, as determined by the owner representative, shall have wood fiber mulch with tacking agent applied at the variable rates shown in the Table 4 below.

TABLE 4

Slope (H:V)	Tacking agent (lbs pure mucilage per acre)	Wood Fiber Mulch (lbs per acre)
Flat to 4:1	22 KG (50 lbs)	453 KG (1,000 lbs)
From greater than 4:1to 3:1	45 KG (100 lbs)	907 KG (2,000 lbs)
From greater than 3:1 to 2:1	68 KG (150 lbs)	1133 KG (2,500 lbs)
Greater than 2:1	90 KG (200 lbs)	1360 KG (3,000 lbs)
Erosive Soil Slopes*	136 KG (300 lbs)	1587 KG (3,500 lbs)

*As determined by owner representative

B. The contractor shall submit a batch (tank) mix quantity schedule for seed application and the temporary erosion control mulch application for approval of the owner representatives prior to mixing seed, fertilizer, wood fiber mulch and tacking agent in a slurry. Batch mixing and coverage will be monitored throughout the seeding operations. The contractor shall coordinate the mixing and application operations with the owner representative in advance of all mixing.

3.07 SEEDING ACCEPTANCE:

A. After application the owner representative will inspect seeded areas or sub-areas for conformance to the contract requirements. The contractor shall correct, to the satisfaction of the owner representative, any areas not conforming to the specifications. The 365-day maintenance period will begin upon acceptance of the area by the owner representative.

B. The contractor shall maintain and stabilize each area or sub-area, including shoulder build up areas, for a minimum period of 365 calendar days after application of the seeding and mulching materials, and acceptance by the owner representative. Any areas damaged from erosion, or that have less than 90 percent of applied mulch remaining, shall be re-seeded, re-mulched, and re-tacked at no additional cost to the Owner.

1. Upon acceptance of hydroseeding operations, maintain all hydroseeding areas for a period of 365 calendar days as follows:
   a. Repair all seed washings and erosion.
   b. Establishment Stage Irrigation: After germination, reduce each watering. The specific watering program shall be approved by owner representative.
2. Weeding: All concentrated developments of weed growth appearing in the seed mix planting areas during the maintenance period shall be removed manually at two week intervals.
3. Seeding shall be completed prior to start of the 365 calendar-day maintenance period, before the end of the contract time or sooner.

END OF SECTION 32 92 19

END OF SPECIFICATIONS

REGISTERED LANDSCAPE ARCHITECT
CERTIFICATE NO.
39813
ERIC R.
BARRETT
04/21
Date Signed
ARIZONA U.S.A.

EXPIRES 9/30/2021

SCALE AS NOTED
APRIL 2021

ARC STUDIOS
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landscape architecture . urban design
environmental services . irrigation design

ARC STUDIOS PROJECT NO: 01-20078

LANDSCAPE SPECIFICATIONS DEVELOPMENT PACKAGE

FOR

TEP PATRIOT SUBSTATION

PARCEL TBD
LOCATED IN NE 1/4 OF SECTION 31, T 14 S, R 15 E, G&SRM,
CITY OF TUCSON, PIMA COUNTY, ARIZONA

DP ___

REF: T21SE00006
COT ADMINISTRATIVE ADDRESS:
6980 EAST ESCALANTE ROAD
TUCSON, ARIZONA 85707

REVISIONS

DATE	ENG	TECH	REV

DESCRIPTION:
ISSUED FOR CONSTRUCTION
PAT SUB DEV PLAN
JOB No. 10449.00 / WO 6297641

TUCSON ELECTRIC POWER
3950 E IRVINGTON RD.
TUCSON, AZ 85714
ATTN: JESUS MARTINEZ
520-396-2551

VENDOR

NAME: | DRAWING #: | SHOP ORDER #: | TEP RO #:

AUTOCADD

Tucson Electric Power Company
TUCSON, ARIZONA

TITLE: SITE DEVELOPMENT
LANDSCAPE SPECIFICATIONS
PATRIOT SUBSTATION

TRSQ T14S,15E,S31
REF # N/A
DWG # 0398-138-04-0016
REV 00 SHEET C16