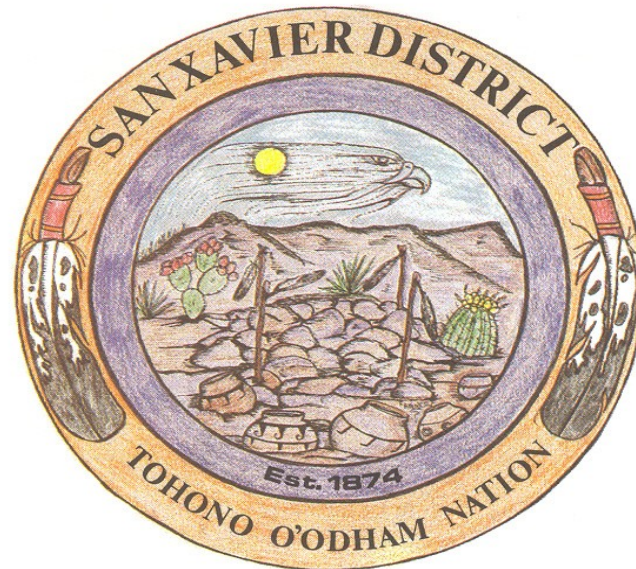
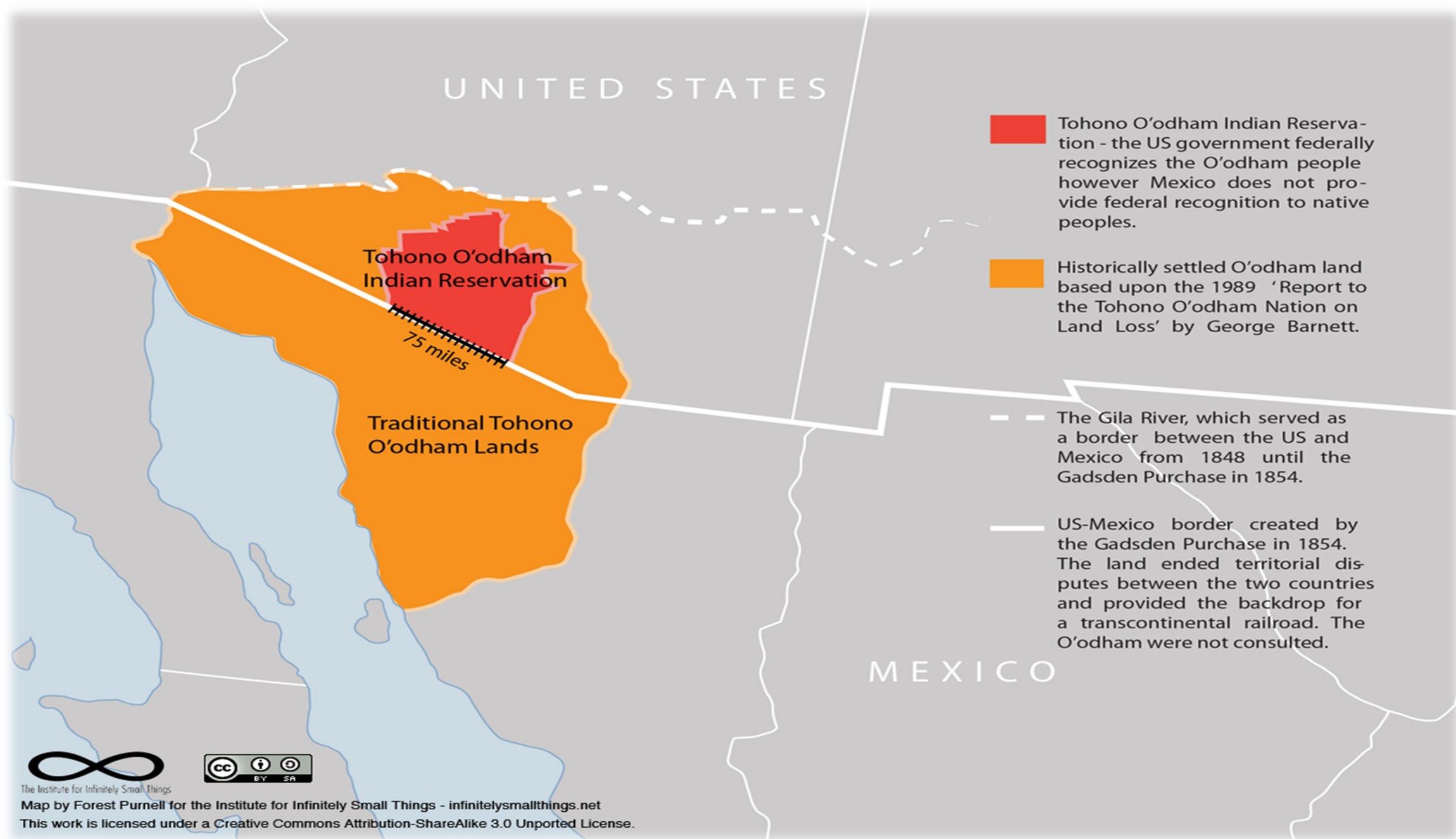


# Overview of San Xavier District (Wa:k Ceksan)

of the Tohono O'odham Nation





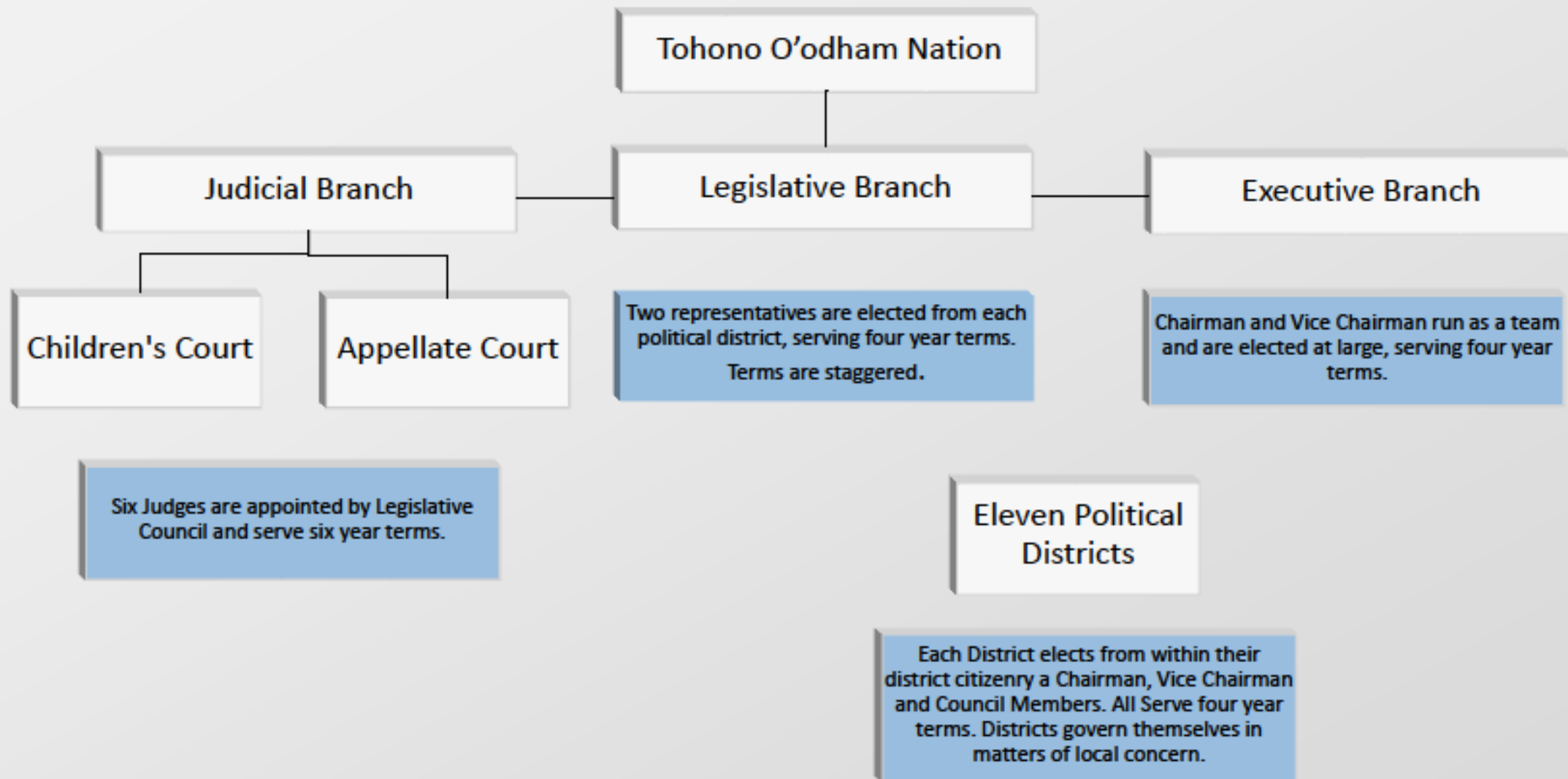
The Institute for Infinitely Small Things  
Map by Forest Purnell for the Institute for Infinitely Small Things - [infinitelysmallthings.net](http://infinitelysmallthings.net)  
This work is licensed under a Creative Commons Attribution-ShareAlike 3.0 Unported License.

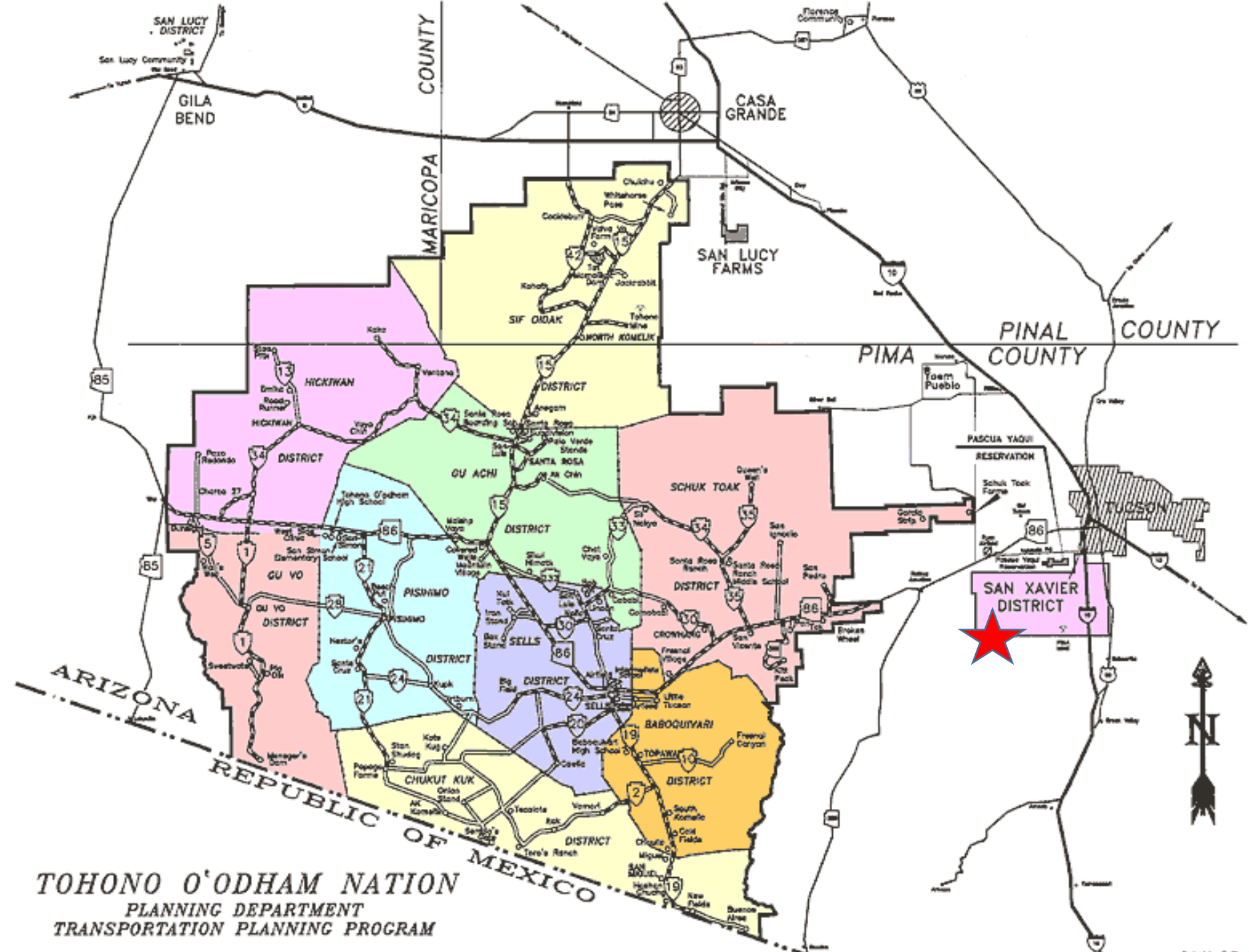


Hohokam Irrigation Visualization









TOHONO O'ODHAM NATION  
 PLANNING DEPARTMENT  
 TRANSPORTATION PLANNING PROGRAM

# 11 Districts of the Tohono O'odham Nation



**San Xavier District**  
Enrollment: 2,389



**San Lucy District**  
Enrollment: 2,356



**Baboquivari District:**  
Enrollment: 3,848



**Sif Oidak District**  
Enrollment: 2,445



**Hickiwan District**  
Enrollment: 2,138



**Gu Vo District**  
Enrollment: 2,645



**Schuk Toak District**  
Enrollment: 1,890



**Gu Achi District**  
Enrollment: 2,793



**Chukut Kuk District**  
Enrollment: 3,475



**Sells District**  
Enrollment: 5,471



**Pisinemo District**  
Enrollment: 2,307

**TOTAL = 31,757**

May 2019



# San Xavier District

- The San Xavier Reservation was established in 1874 by an executive order.
  - Tohono O'odham ancestors - the Hohokam have resided at this location for centuries.
- The O'odham have historically farmed lands of the Santa Cruz valley.
  - O'odham were known as the "two-villagers" because during the winter season they stayed at villages in the mountains near the springs and wells; in the summers they would migrate to the Santa Cruz River where they would farm.



# Location of San Xavier

- San Xavier is located approximately twelve miles south of downtown Tucson, Arizona.
- Total of 73,000 acres of Sonoran Desert
- San Xavier District is one of eleven political subdivisions of the Tohono O'odham Nation



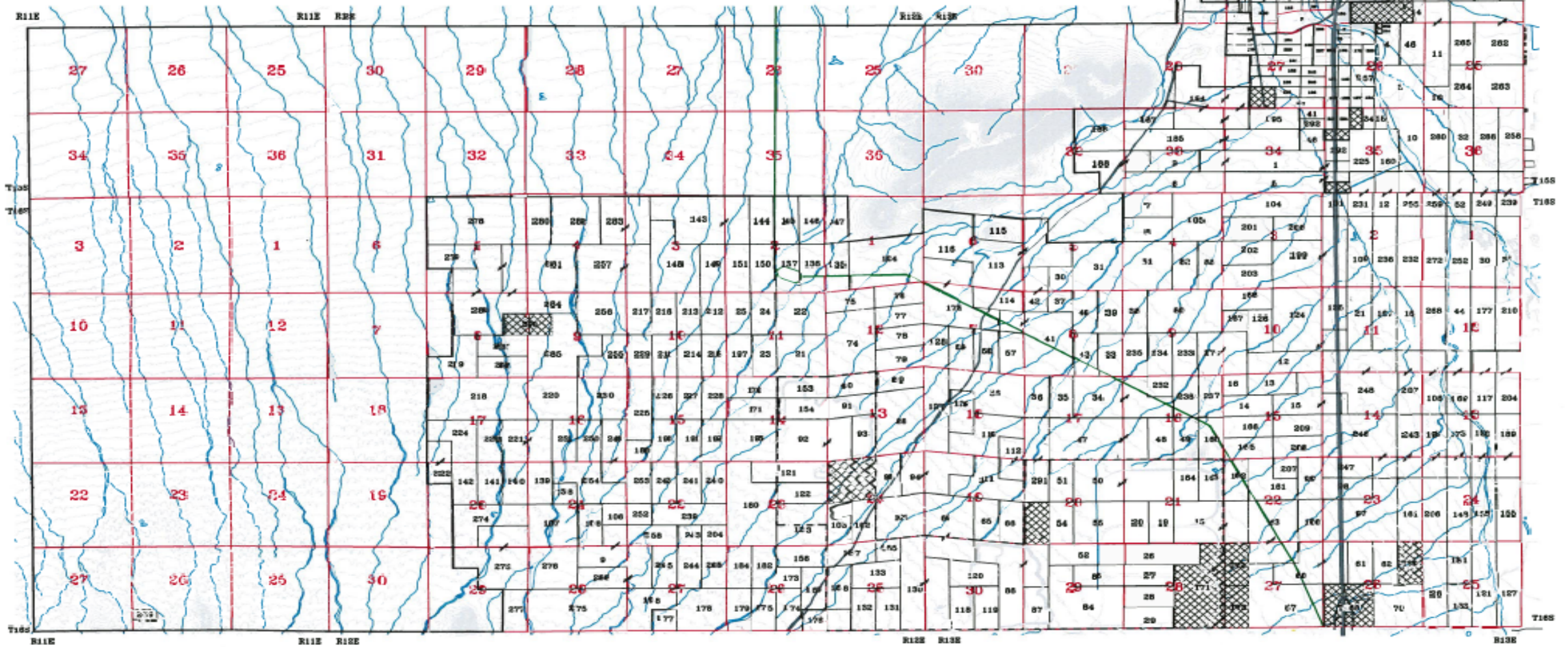


**SAN XAVIER DISTRICT**  
**TOHONO O'ODHAM NATION**  
2010 W. SAN XAVIER ROAD TUCSON, ARIZONA 85746  
Phone: (520) 375-4074 Fax: (520) 807-5473  
Maped by: D.Lopez Jan 2002 A.P.Hick May 2004  
Revised: R.Aronov Aug 2012

# SAN XAVIER DISTRICTWIDE MAP

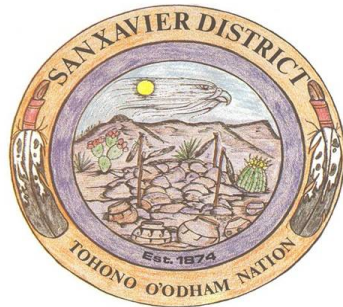
## LEGEND

- |  |  |  |                   |
|--|--|--|-------------------|
|  | TRUST- Tribally Owned by The Tohono O'odham Nation |  | Contours          |
|  | TRUST- Tribally Owned in Reserve Status            |  | Washes            |
|  | FEE LANDS  |  | Minor Leases      |
|  | GOVERNMENT OWNED- BIA                              |  | 1-12              |
|  | 29 SECTION NUMBERS                                 |  | Roads             |
|  | 30 ALLOTMENTS                                      |  | Buildings         |
|  | T188 TOWNSHIP                                      |  | CAP               |
|  | R1E2 RANGE   |  | DISTRICT BOUNDARY |
|  | SECTION LINES                                      |  | ADJACENT NATION   |

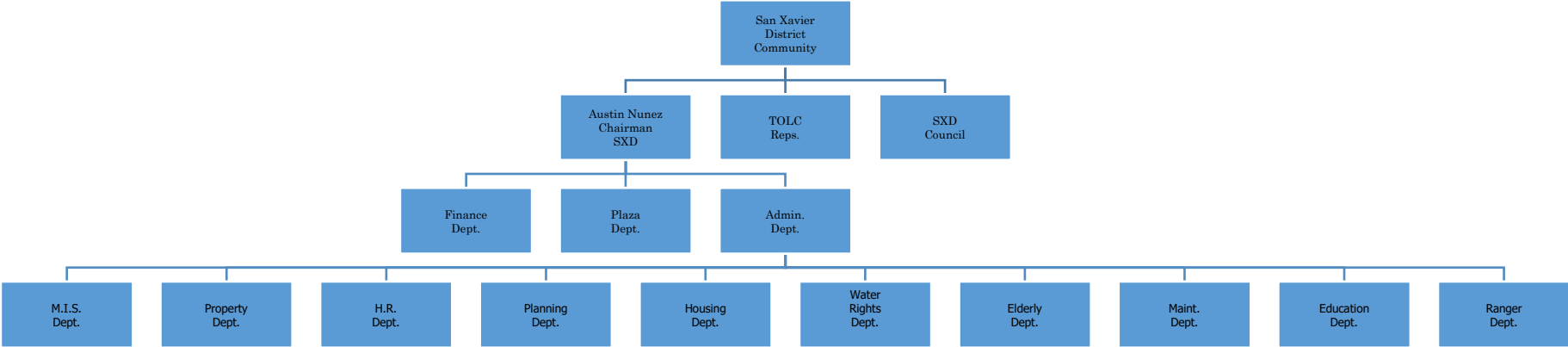


# San Xavier District Mission Statement

- The mission of the San Xavier District Government Office is to promote self-determination and provide a legacy for future generations by guiding, leading, and supporting the community in the protection and preservation of the land, water, air, culture, traditions, knowledge, language, and vitality of the commur



# San Xavier District Organizational Chart



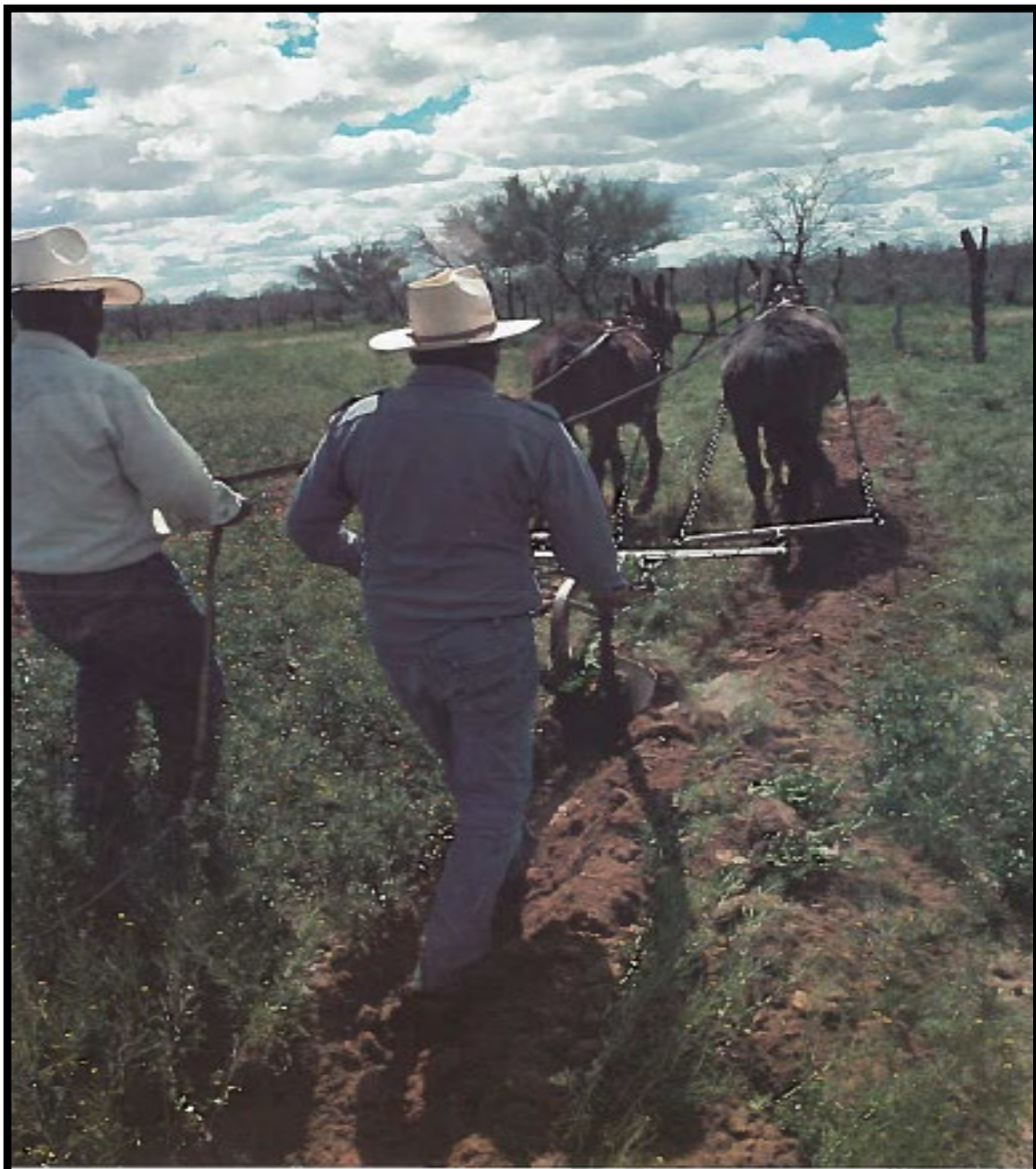


The San Xavier District is located approximately 12 miles southwest of Tucson, AZ and is home to the Wa:k O'odham Community.

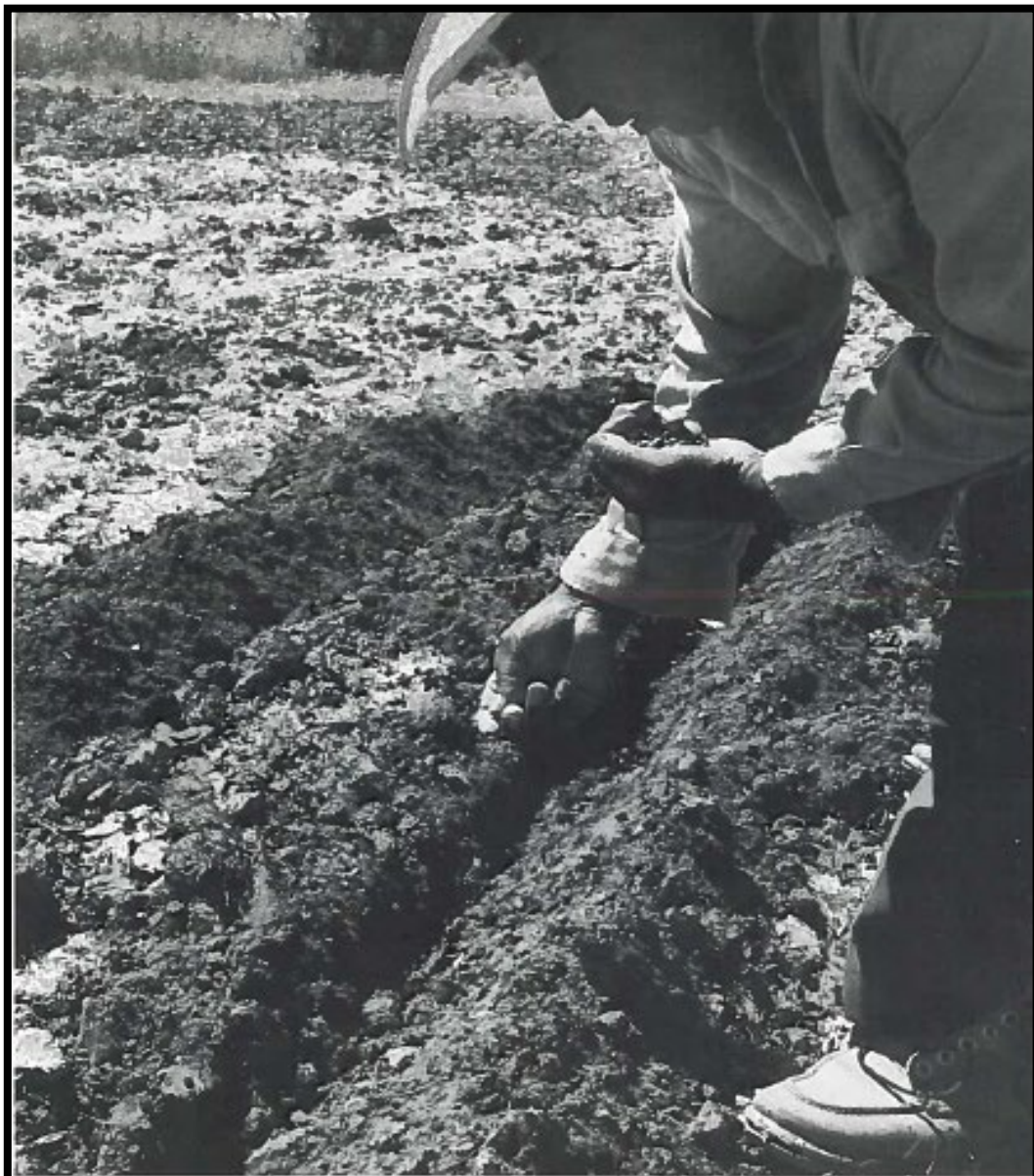
The San Xavier Reservation was established in 1874 by an executive order.

Tohono O'odham ancestors-the Hohokam have resided at this location since time immemorial.

The O'odham have historically farmed lands of the Santa Cruz valley.



*While one man guides the plow, another leads the horses. Rows are plowed about 3 meters apart, and turned towards the middle.*



*Seeds are planted on the slope of the freshly turned, moist soil. Usually they are sown by hand while walking behind the plow.*

# Impacts of Groundwater Depletion

- More people started moving to the area
- Water was needed by the growing mining industry and off-reservation farming
- Faster ways to pump groundwater were developed to meet these needs
- Today the river only flows during monsoon floods
- Mesquite Bosque & riparian habitat was destroyed
- Co-op Farm Wells dried up in 1980s

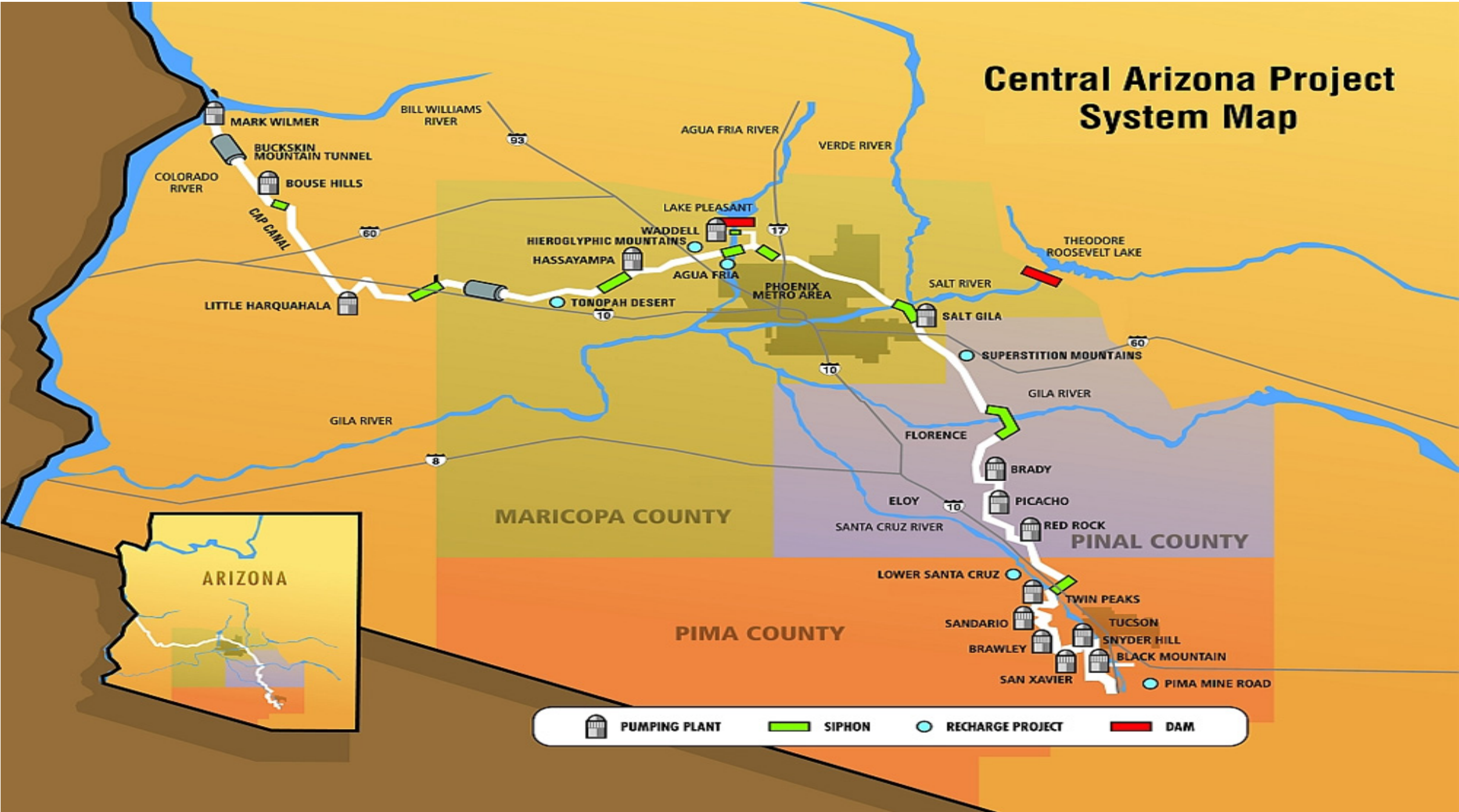




# Water Rights History

- 1975 U.S. v. Tucson water rights law suit
- 1982 Southern Arizona Water Rights Settlement Act (SAWRSA) was passed by congress and signed by President Regan
- 1986 new Tohono O'odham Constitution - Nation claims all natural resources and water
- 1991 San Xavier Allottees Association was formed
- 1993 Alvarez v. Tucson water rights lawsuit filed
- 1995 Interior Department Opinion says allottees own water rights.
- 2004 SAWRSA Amendments – signed by President Bush on December 10, 2004.

# Central Arizona Project System Map





# Arizona Water Protection Fund

In 1996, the Arizona Water Protection Fund provided a grant to the San Xavier community to help them develop and implement strategies for enhancing the condition of selected riparian areas on District lands near the Santa Cruz River.



## 12-Acre Site Prior to Planting



“Efforts to re-vegetate areas and restore riparian areas that have been damaged, especially those along the Santa Cruz River, will be studied. With time, these areas can begin to heal and grow back”...

# Wetland Construction

We





# The pond, and stream at the Hikdan Project site.





# Recreation



# Riparian Restoration Site II



- Site II is approximately 5 acres in size.
- This site lies about 1 mile from Wa:k Hikdan.
- Planting was established in 2006
- Plants consist mainly of mesquite trees, desert broom, and Sacaton grass. Only 1 cottonwood tree on site





# San Xavier Solar Project – District and Education Buildings

## Project Summary

- The project consists of the development and construction of two grid-tied photovoltaic (PV) systems in the San Xavier District (SXD or the District) of the Tohono O’odham Nation (TON). The Tohono O’odham Nation is located along the U.S.-Mexico border in Southern Arizona. The San Xavier District is one of the eleven political subdivisions of TON, located in Pima County, Arizona.
- The District will develop PV energy generating systems for two tribal buildings:
  - 1) San Xavier District Administration Building, ~32,000 sq. ft, and
  - 2) Education Center~10,024 sq. ft.
- From October 2018 to September 2019, the Administration Building and the Education Center consumed 389,120 kWh and 130,564 kWh electric energy, respectively.
- For the Administration Building, an approximately 182 kW DC solar PV system will produce roughly 310,000 kWh/year and displace ~80% of the energy use of the building. For the Education Center, an approximately 73.5 kW DC solar PV system will produce roughly 130,000 kWh/year and displace ~95% of the energy use of the building. The anticipated 25-year cost savings are estimated to be approximately \$1,750,000 and \$820,000, for the Administration Building and the Education Center, respectively.

# San Xavier Solar Project – District and Education Buildings

- Established in 1937, the San Xavier District is one of the eleven districts which comprise the Tohono O'odham Nation. Containing nearly 72,000 acres of Sonoran Desert, the District accounts for 7% of the Tohono O'odham Nation's population with a total enrollment of approximately 2,300 individuals; of which, only approximately 1,200 reside within the District's jurisdiction.
- The mission of the San Xavier District is: "...to promote self-determination and provide a legacy for future generations by guiding, leading, and supporting community in the protection and preservation of the land, water, air, culture, traditions, knowledge, language, and viability of community."

# San Xavier Solar Project – District and Education Buildings

The Overall Energy Goals are:

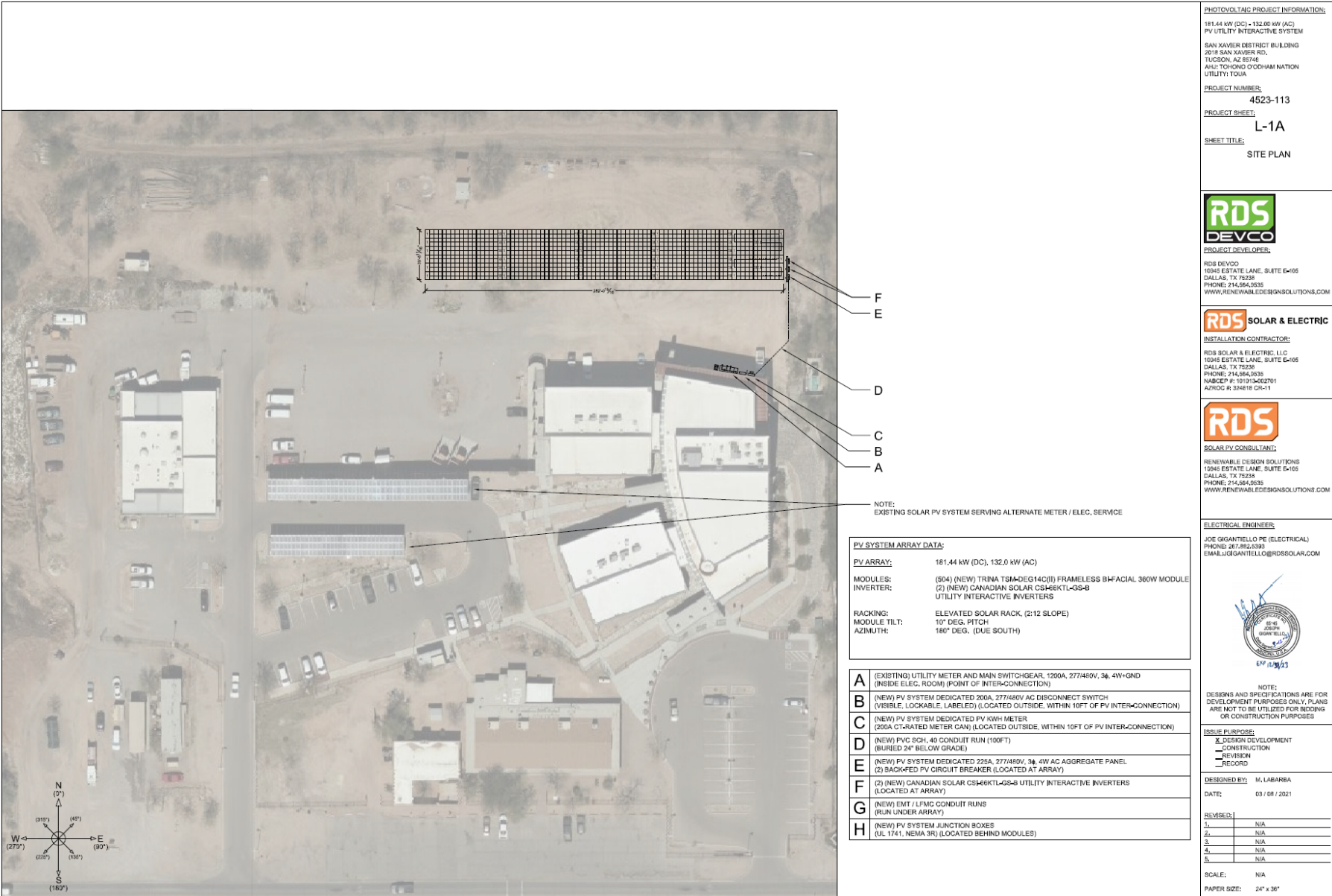
- i) Support the strategic goals, plans, and mission of the Tribe, including preserving and sharing cultural traditions; improving the general welfare of the tribal community; and compassionately providing for the people and future generations (strategically Integrated with District's long-term goals);
- ii) Minimize life-cycle costs of energy services compared to historic costs (more affordable);
- iii) Support tribal environmental and net-zero energy goals by reducing reliance on non-renewable energy resources, increasing local renewable generating capacity, and reducing the Tribe's environmental footprint (more sustainable);
- iv) Improve the energy cost-effectiveness. The proposed solar projects are designed to produce energy over a 25-year horizon, free of charge except for operation and maintenance;
- v) Improve energy independence. Currently, the District heavily relies on non-renewable commercial power. The proposed projects will allow the power demand being met from a locally generated renewable energy source; and
- vi) Economic development. Economic development is a very high priority for the Tribe given the high poverty and unemployment rates on the reservation. The Tribe expects to drive projects that can generate employment for the members as well as provide training and expertise for high-demand jobs.

# San Xavier Solar Project – District and Education Buildings

The Secondary Goals are:

- i) Promote renewable energy use. Demonstrate the renewable energy technologies and educate the tribal members in the District and the Tohono O’odham Nation promoting the use of renewable energy on tribal lands;
  - ii) Workforce development. Train local workers within the District or the TON; and
  - iii) Staff capacity building. Build in-house capacity for the management, operation, and maintenance of commercial-size renewable energy projects.
- 
- The District has committed to the deployment of renewable energy infrastructure for the last decade or so. In 2013, the first solar PV system (60kW DC) was installed to reduce the utility costs and the dependency on commercial power. In 2019, another solar PV system (100kW DC) was constructed for the District’s Senior Services Center and the Maintenance Building. Both of the projects have significantly contributed to the District’s Overall Energy Goals. The success from the past projects has demonstrated the feasibility and the effectiveness of the technologies, which will be used in this current project.

# San Xavier Solar Project – District Building



**PHOTOVOLTAIC PROJECT INFORMATION:**  
 181.44 kW (DC) - 132.00 kW (AC)  
 PV UTILITY INTERACTIVE SYSTEM  
 SAN XAVIER DISTRICT BUILDING  
 2018 SAN XAVIER RD.  
 TUCSON, AZ 85748  
 AUSTIN ENERGY CO/COCHAM NATION  
 UTILITY: TOUJA  
**PROJECT NUMBER:**  
 4523-113  
**PROJECT SHEET:**  
 L-1A  
**SHEET TITLE:**  
 SITE PLAN

**RDS DEVCO**  
 PROJECT DEVELOPER:  
 RDS DEVCO  
 10945 ESTATE LANE, SUITE E-105  
 DALLAS, TX 75228  
 PHONE: 214.584.9538  
 WWW.RENEWABLEDESIGNSOLUTIONS.COM

**RDS SOLAR & ELECTRIC**  
 INSTALLATION CONTRACTOR:  
 RDS SOLAR & ELECTRIC, L.L.C.  
 10945 ESTATE LANE, SUITE E-105  
 DALLAS, TX 75228  
 PHONE: 214.584.9538  
 NUMBER: 181315402701  
 AZNOC R 324816 CR-11

**RDS**  
 SOLAR PV CONSULTANT:  
 RENEWABLE DESIGN SOLUTIONS  
 10945 ESTATE LANE, SUITE E-105  
 DALLAS, TX 75228  
 PHONE: 214.584.9538  
 WWW.RENEWABLEDESIGNSOLUTIONS.COM

**ELECTRICAL ENGINEER:**  
 JOE GIGANTELLO PE (ELECTRICAL)  
 PHONE: 214.584.9538  
 EMAIL: JOEGIGANTELLO@RDSOLAR.COM

**NOTES:**  
 DESIGNS AND SPECIFICATIONS ARE FOR DEVELOPMENT PURPOSES ONLY. PLANS ARE NOT TO BE UTILIZED FOR BIDDING OR CONSTRUCTION PURPOSES.

**ISSUE PURPOSE:**  
 DESIGN DEVELOPMENT  
 CONSTRUCTION  
 REVISION  
 RECORD

**DESIGNED BY:** M. LABARBA  
**DATE:** 03 / 08 / 2021

**REVISED:**

|    |     |
|----|-----|
| 1. | N/A |
| 2. | N/A |
| 3. | N/A |
| 4. | N/A |
| 5. | N/A |

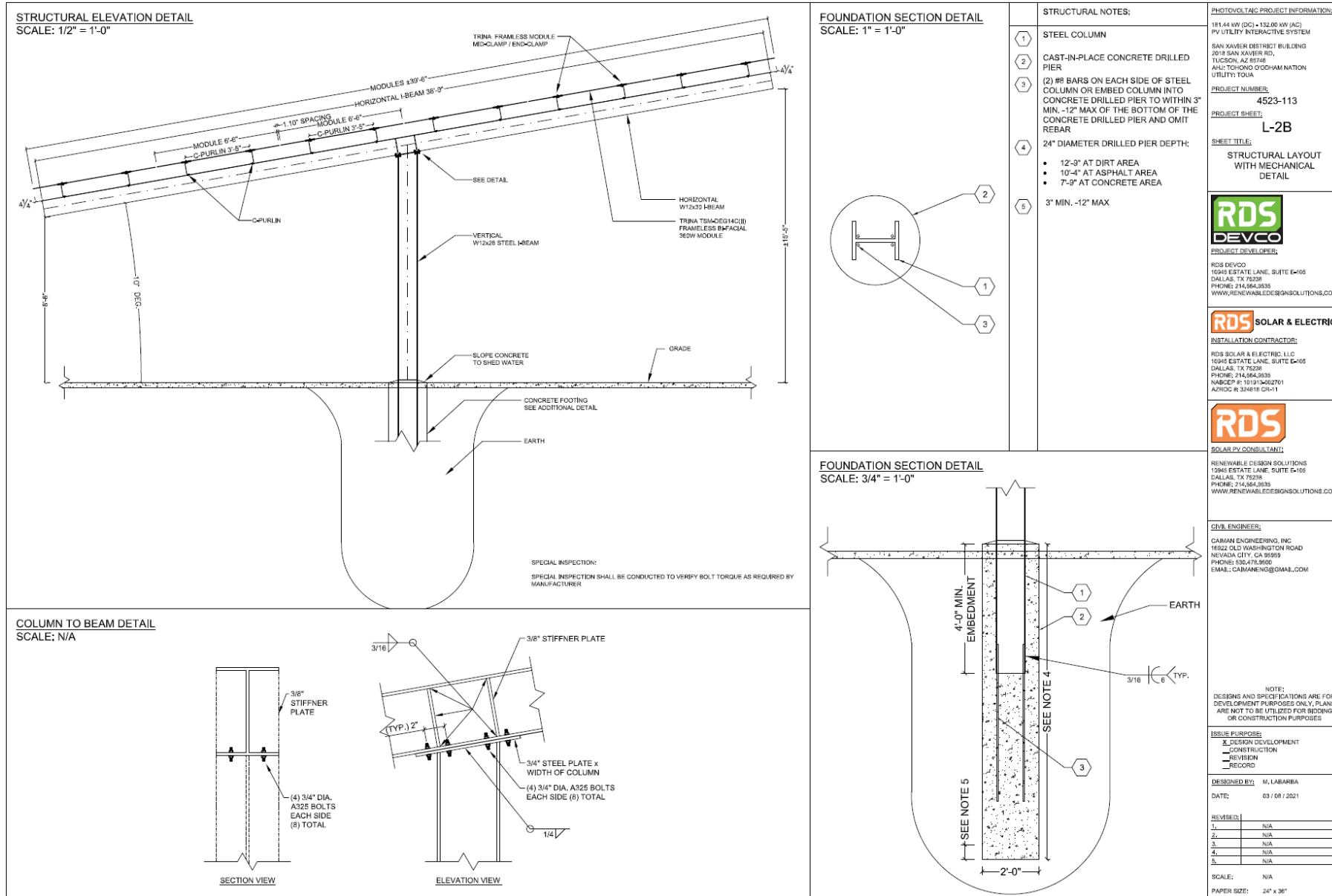
**SCALE:** N/A  
**PAPER SIZE:** 24" x 36"

**PV SYSTEM ARRAY DATA:**  
**PV ARRAY:** 181,44 kW (DC), 132,0 kW (AC)  
**MODULES:** (504) (NEW) TRINA TSM-DEG14C(B) FRAMELESS BIFACIAL 360W MODULE  
**INVERTER:** (2) (NEW) CANADIAN SOLAR CS46KTL-GS-8 UTILITY INTERACTIVE INVERTERS  
**RACKING:** ELEVATED SOLAR RACK, (2-12 SLOPE)  
**MODULE TILT:** 10° DEG. PITCH  
**AZIMUTH:** 180° DEG. (DUE SOUTH)

- A** (EXISTING) UTILITY METER AND MAIN SWITCHGEAR, 1200A, 277/480V, 3ø, 4W+GND (INSIDE ELEC. ROOM) (POINT OF INTERCONNECTION)
- B** (NEW) PV SYSTEM DEDICATED 200A, 277/480V AC DISCONNECT SWITCH (VISIBLE, LOCKABLE, LABELED) (LOCATED OUTSIDE, WITHIN 10FT OF PV INTER-CONNECTION)
- C** (NEW) PV SYSTEM DEDICATED PV KWH METER (200A CT-RATED METER CAN) (LOCATED OUTSIDE, WITHIN 10FT OF PV INTER-CONNECTION)
- D** (NEW) PVC SCH. 40 CONDUIT RUN (100FT) (BURIED 24" BELOW GRADE)
- E** (NEW) PV SYSTEM DEDICATED 225A, 277/480V, 3ø, 4W AC AGGREGATE PANEL (2) BACK-FED PV CIRCUIT BREAKER (LOCATED AT ARRAY)
- F** (2) (NEW) CANADIAN SOLAR CS46KTL-GS-8 UTILITY INTERACTIVE INVERTERS (LOCATED AT ARRAY)
- G** (NEW) EMT / LFMC CONDUIT RUNS (RUN UNDER ARRAY)
- H** (NEW) PV SYSTEM JUNCTION BOXES (UL 1741, NEMA 3R) (LOCATED BEHIND MODULES)



# San Xavier Solar Project – District Building



# San Xavier Solar Project – District Building

| CONDUCTOR SCHEDULE: |                                 |                        |                                |                                 |                     |                           |              |                |          |                  |
|---------------------|---------------------------------|------------------------|--------------------------------|---------------------------------|---------------------|---------------------------|--------------|----------------|----------|------------------|
| WIRE SCH. NAME      | CURRENT CARRYING CONDUCTOR SIZE | NEUTRAL CONDUCTOR SIZE | E.G.C. / G.E.C. CONDUCTOR SIZE | CURRENT CARRYING CONDUCTOR TYPE | CONDUIT SIZE / TYPE | RUN TYPE                  | PARALLEL RUN | VOLTAGE RATING | DISTANCE | VOLTAGE DROP (%) |
| AC1                 | #2 AWG XHHW-2 CU                | #6 AWG XHHW-2 CU       | #6 AWG XHHW-2 CU               | XHHW-2 CU 90°C                  | 1.25" EMT           | RUN ACROSS EQUIPMENT WALL | NO           | <600V          | <10 FT   | TBD              |
| AC2                 | 250 KCMIL XHHW-2 AL             | #4 AWG XHHW-2 AL       | #4 AWG XHHW-2 AL               | XHHW-2 AL 90°C                  | 2.5" PVC 40         | BURIED 24" BELOW GRADE    | NO           | <600V          | <100 FT  | TBD              |
| AC3                 | 4/0 AWG XHHW-2 CU               | #6 AWG XHHW-2 CU       | #6 AWG XHHW-2 CU               | XHHW-2 CU 90°C                  | 2.5" EMT            | RUN ACROSS EQUIPMENT WALL | NO           | <600V          | <10 FT   | TBD              |
| AC4                 | 4/0 AWG XHHW-2 CU               | #6 AWG XHHW-2 CU       | #6 AWG XHHW-2 CU               | XHHW-2 CU 90°C                  | 2.5" EMT            | RUN ACROSS EQUIPMENT WALL | NO           | <600V          | <10 FT   | TBD              |
| AC5                 |                                 |                        |                                |                                 |                     |                           |              |                |          |                  |
| AC6                 |                                 |                        |                                |                                 |                     |                           |              |                |          |                  |

NOTE:  
PER NEC 705.95(B), THE NEUTRAL CONDUCTOR, IF SOLELY USED FOR PHASE / VOLTAGE DETECTION, SHALL BE PERMITTED TO BE SIZED EQUAL TO OR LARGER THAN THE EQUIPMENT GROUNDING CONDUCTOR.

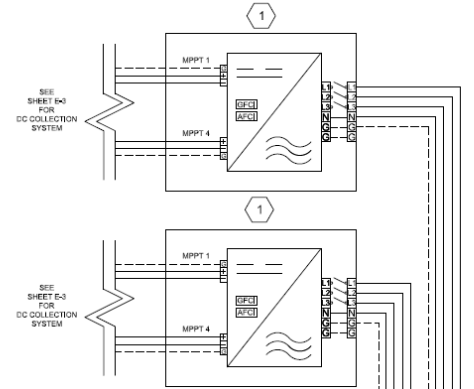
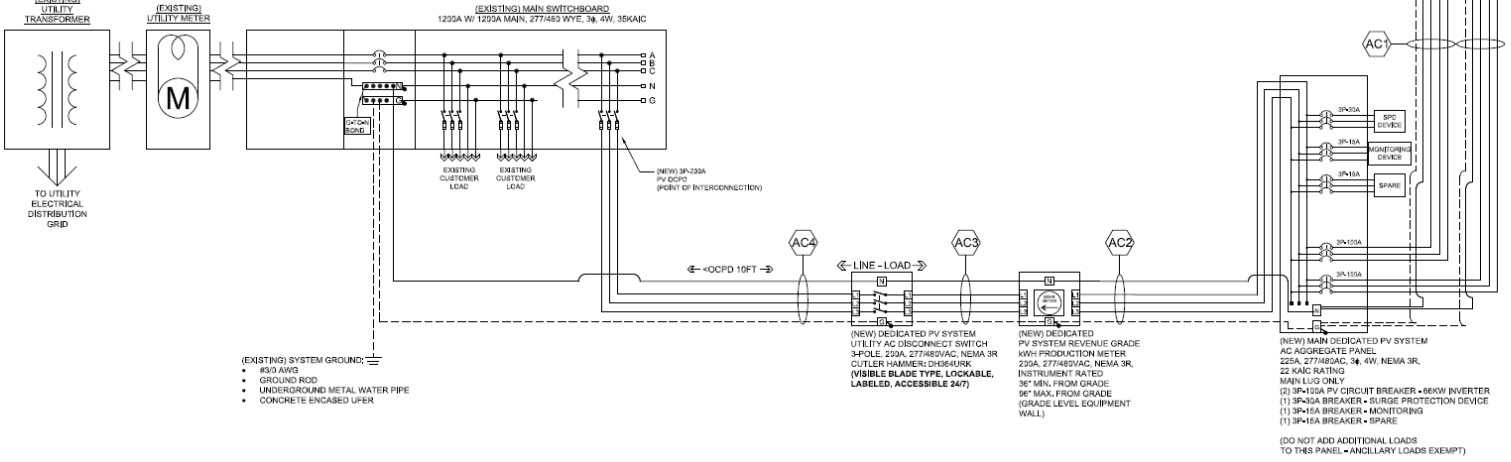
| LEGEND              |   |
|---------------------|---|
| GROUNDING CONDUCTOR | — |
| CIRCUIT CONDUCTOR   | — |
| LINE 1 TERMINAL     | 1 |
| LINE 2 TERMINAL     | 2 |
| LINE 3 TERMINAL     | 3 |
| GROUND              | ⊕ |
| CIRCUIT BREAKER     | ⏏ |
| DISCONNECT SWITCH   | ⏏ |
| FUSE                | ⏏ |
| IRREVERSIBLE SPLICE | ⏏ |
| GROUND              | ⊕ |

**1** (NEW) MANUFACTURER MODEL: CANADIAN SOLAR CSI6KTL-05-B INVERTER  
277480VAC 3φ, 60Hz  
MPPT VOLTAGE RANGE: ST9480V  
MAX INPUT VOLTAGE: 1050 VDC  
MAX INPUT CURRENT (Isc): 220A (95A PER MPPT)  
MAX OUTPUT CURRENT: 175A  
CEO EFFICIENCY: 98.4%  
APC2 AND OCP1 PROTECTION  
LOAD RATED: DC & AC DISCONNECTS  
UL 1741, UL 1741SA, UL 1699B, IEEE 1547

**PV SUB-SYSTEM ELECTRICAL DATA:**  
STC: 181.44 kW (DC) / 132.0 kW (AC)  
(2) PV SUB-SYSTEM ARRAYS, EACH WITH  
(14) SOURCE CIRCUIT OUTPUTS  
(252) TRINA TSM-DEG14C(D) FRAMELESS BIFACIAL 360W MODULE  
(4) STRING(S) OF (18) MODULES - IN SERIES TO MPPT 1  
(4) STRING(S) OF (18) MODULES - IN SERIES TO MPPT 2  
(3) STRING(S) OF (18) MODULES - IN SERIES TO MPPT 3  
(3) STRING(S) OF (18) MODULES - IN SERIES TO MPPT 4



NOTE:  
EXISTING BACKUP GENERATORS SHALL BE FIELD INVESTIGATED TO BE ELECTRICALLY ISOLATED DOWNSTREAM VIA PROPER ATS CONFIGURATIONS, ANY BACKUP GENERATOR THAT IS NOT ELECTRICALLY ISOLATED FROM THE PROPOSED SOLAR PV SYSTEM, SHALL BE COMMUNICATED AND COORDINATED WITH THE SOLAR ENGINEER OF RECORD PRIOR TO INSTALLATION.



**PHOTOVOLTAIC PROJECT INFORMATION:**  
181.44 kW (DC) / 132.00 kW (AC)  
PV UTILITY INTERACTIVE SYSTEM  
SAN XAVIER DISTRICT BUILDING  
2018 SAN XAVIER RD.  
TUCSON, AZ 85714  
AHL: TORI HONG O'DONAM NATION  
UTILITY: TDU

**PROJECT NUMBER:** 4523-113  
**PROJECT SHEET:** E-4  
**SHEET TITLE:** 3-LINE ELECTRICAL DIAGRAM (AC COLLECTION SYSTEM)

**RDS DEVCO**  
PROJECT DEVELOPER  
RDS DEVCO  
1045 ESTATE LANE, SUITE 6-105  
DALLAS, TX 75238  
PHONE: 214.584.0535  
WWW.RENEWABLEDESIGNSOLUTIONS.COM

**RDS SOLAR & ELECTRIC**  
INSTALLATION CONTRACTOR  
RDS SOLAR & ELECTRIC, L.L.C.  
1045 ESTATE LANE, SUITE 6-105  
DALLAS, TX 75238  
PHONE: 214.584.0535  
NABCEP #: 101915-002701  
AZRSC #: 334816 CR-1

**RDS**  
SOLAR PV CONSULTANT  
RENEWABLE DESIGN SOLUTIONS  
1045 ESTATE LANE, SUITE 6-105  
DALLAS, TX 75238  
PHONE: 214.584.0535  
WWW.RENEWABLEDESIGNSOLUTIONS.COM

**ELECTRICAL ENGINEER:**  
JOE GRANTELLO PE (ELECTRICAL)  
PHONE: 267.882.0393  
EMAIL: JG@GRANTELLO.COM

NOTE:  
DESIGNS AND SPECIFICATIONS ARE FOR DEVELOPMENT PURPOSES ONLY, PLANS ARE NOT TO BE UTILIZED FOR BIDDING OR CONSTRUCTION PURPOSES

**ISSUE PURPOSE:**  
[X] DESIGN DEVELOPMENT  
[ ] CONSTRUCTION  
[ ] REVISION  
[ ] RECORD

**DESIGNED BY:** M. LABARRIA  
**DATE:** 03 / 08 / 2021

| REVISION: | DATE: |
|-----------|-------|
| 1.        | N/A   |
| 2.        | N/A   |
| 3.        | N/A   |
| 4.        | N/A   |
| 5.        | N/A   |

**SCALE:** N/A  
**PAPER SIZE:** 24" x 36"

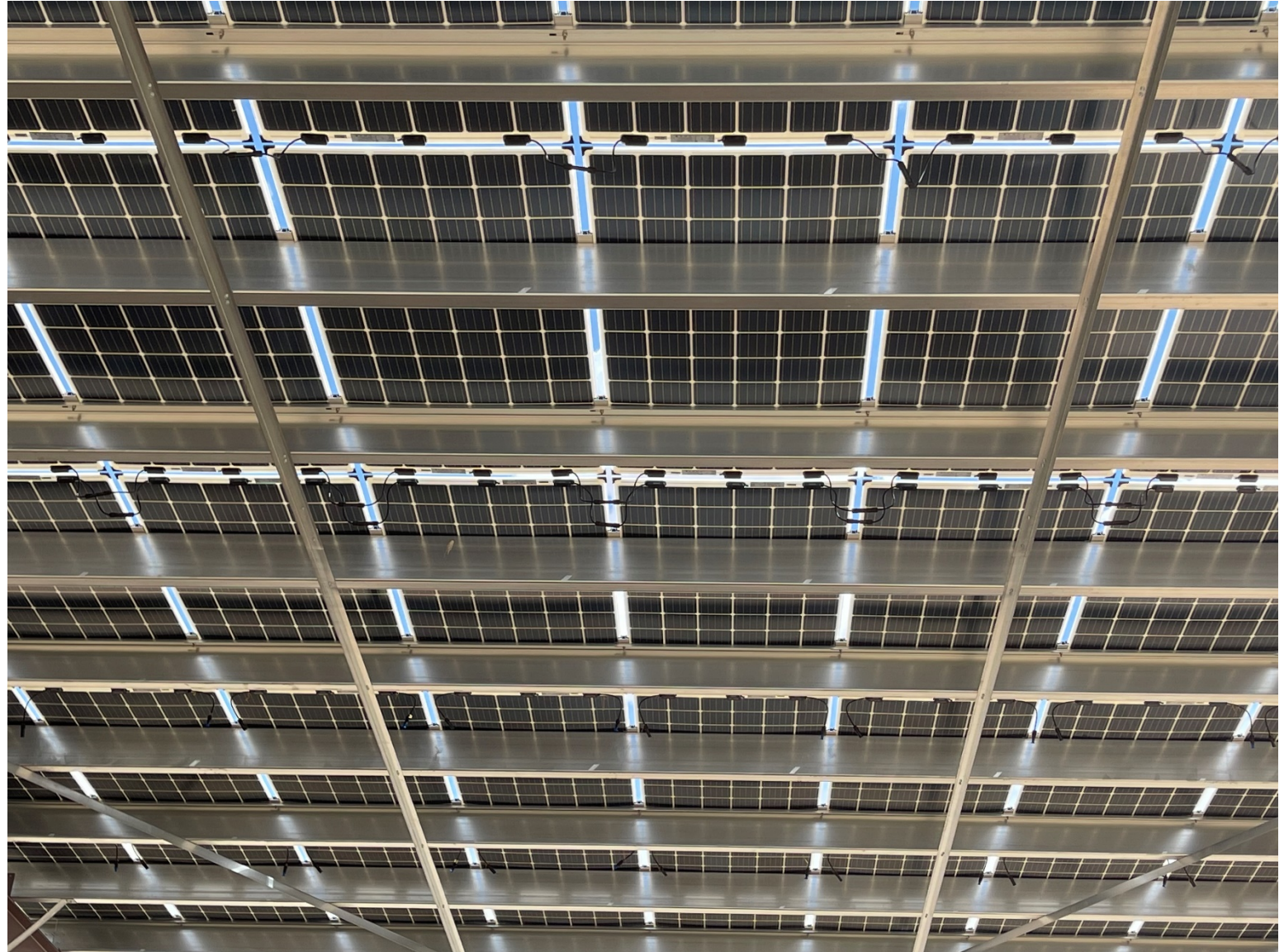
# San Xavier Solar Project – District Building



# San Xavier Solar Project – District Building



# San Xavier Solar Project – District Building



# San Xavier Solar Project – District Building



# San Xavier Solar Project – District Building

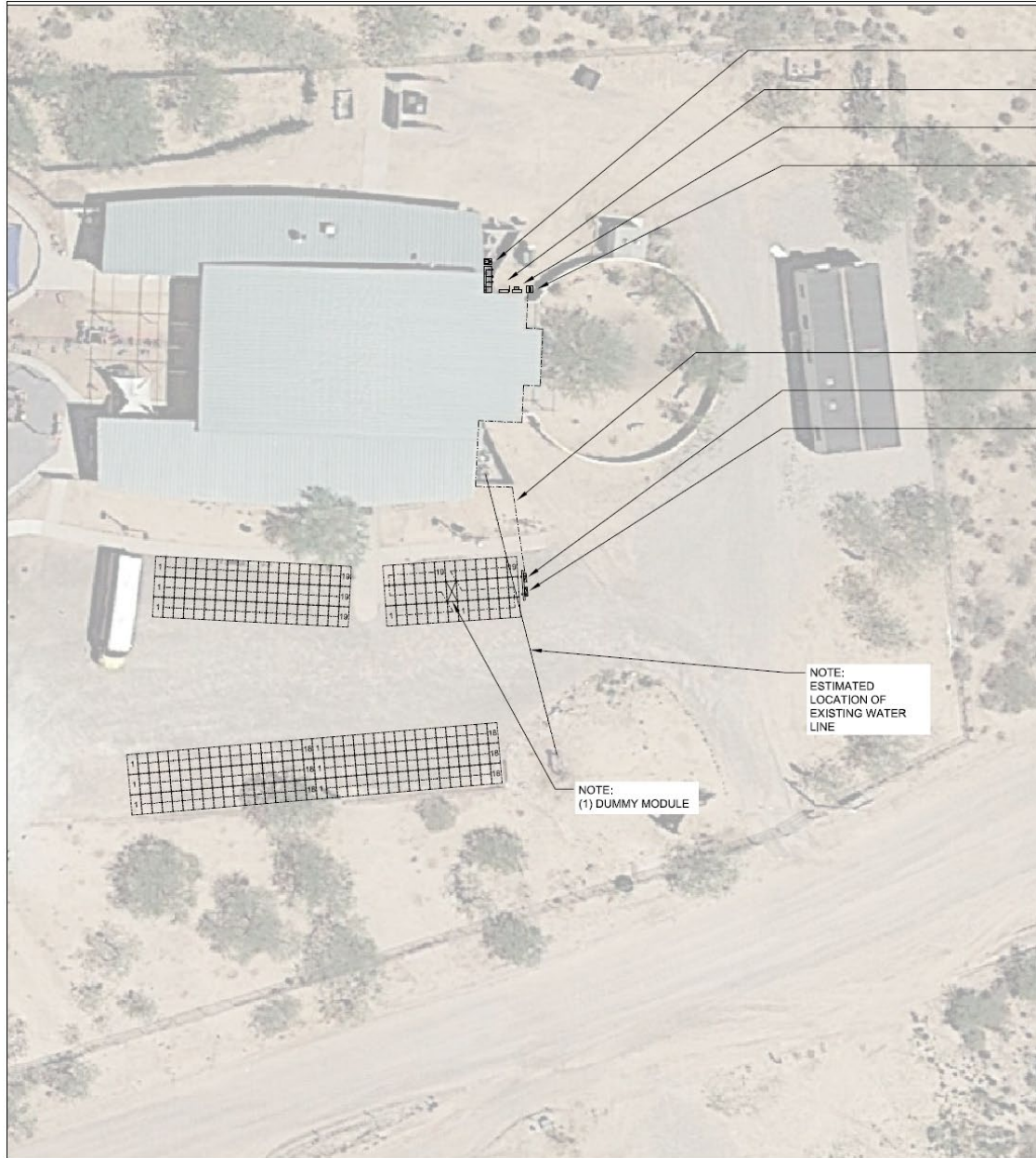


# San Xavier Solar Project – District Building





# San Xavier Solar Project – Education Building



| PV SYSTEM ARRAY DATA: |   |
|-----------------------|---|
| PV ARRAY:             | 73.08 kW (DC), 60.0 kW (AC)   |
| MODULES:              | (203) (NEW) TRINA TSM-DEG 14C(II) FRAMELESS BI-FACIAL 360W MODULE     |
| INVERTER:             | (1) (NEW) CANADIAN SOLAR CSI-60KTL-GS-B UTILITY INTERACTIVE INVERTERS |
| RACKING:              | ELEVATED SOLAR RACK, (2:12 SLOPE)                                     |
| MODULE TILT:          | 10° DEG. FITCH  |
| AZIMUTH:              | 175° DEG. (148 MODULES)<br>185° DEG. (57 MODULES)                     |

|          |   |
|----------|---|
| <b>A</b> | (EXISTING) UTILITY METER AND MAIN SWITCHGEAR, 800A, 120/288V, 3ø, 4W+GND (LOCATED OUTSIDE) (POINT OF INTER-CONNECTION)                          |
| <b>B</b> | (NEW) PV SYSTEM DEDICATED 400A, 120/208V AC DISCONNECT SWITCH (VISIBLE, LOCKABLE, LABELED) (LOCATED OUTSIDE, WITHIN 10FT OF PV INTERCONNECTION) |
| <b>C</b> | (NEW) PV SYSTEM DEDICATED PV KWH METER (200A CT-RATED METER CAN) (LOCATED OUTSIDE)  |
| <b>D</b> | (NEW) PV SYSTEM DEDICATED STEP DOWN TRANSFORMER, 75 KVA (LOCATED OUTSIDE)   |
| <b>E</b> | (NEW) PVC SCH. 40 CONDUIT RUN / EMT CONDUIT RUN (30FT + 110FT ) (BURIED 24" BELOW GRADE / RUN UNDER BLDN EAVE)                                  |
| <b>F</b> | (NEW) PV SYSTEM DEDICATED 125A, 277/480V, 3ø, 4W AC AGGREGATE PANEL (1) BACK-FED PV CIRCUIT BREAKER (LOCATED AT ARRAY)                          |
| <b>G</b> | (1) (NEW) CANADIAN SOLAR CSI-60KTL-GS-B UTILITY INTERACTIVE INVERTER (LOCATED AT ARRAY)   |
| <b>H</b> | (NEW) EMT / LMC CONDUIT RUNS (RUN UNDER ARRAY)  |
| <b>I</b> | (NEW) PV SYSTEM JUNCTION BOXES (UL 1741, NEMA 3R) (LOCATED BEHIND MODULES)  |

**PHOTOVOLTAIC PROJECT INFORMATION:**  
 73.08 KW (DC) - 60.0 KW (AC)  
 PV UTILITY INTERACTIVE SYSTEM  
 SAN XAVIER EDUCATION BUILDING  
 1960 WAK LANE  
 TUCSON, AZ 85746  
 AIA: TORONDO O'DOHAM NATION  
 UTILITY: TCUA  
**PROJECT NUMBER:**  
 4523-113  
**PROJECT SHEET:**  
 L-1  
**SHEET TITLE:**  
 SITE PLAN

**RDS DEVCO**  
 PROJECT DEVELOPER:  
 RDS DEVCO  
 10945 ESTATE LANE, SUITE E-105  
 DALLAS, TX 75238  
 PHONE: 214.564.9535  
 WWW.RENEWABLEDESIGNSOLUTIONS.COM

**RDS SOLAR & ELECTRIC**  
 INSTALLATION CONTRACTOR:  
 RDS SOLAR & ELECTRIC, L.L.C.  
 10945 ESTATE LANE, SUITE E-105  
 DALLAS, TX 75238  
 PHONE: 214.564.9535  
 NABCEP #: 101913-002701  
 AIA/CES #: 336818 QP-11

**RDS**  
 SOLAR PV CONSULTANT:  
 RENEWABLE DESIGN SOLUTIONS  
 10945 ESTATE LANE, SUITE E-105  
 DALLAS, TX 75238  
 PHONE: 214.564.9535  
 WWW.RENEWABLEDESIGNSOLUTIONS.COM

**ELECTRICAL ENGINEER:**  
 JOE GIGANTIELLO PE (ELECTRICAL)  
 PHONE: 267.282.6393  
 EMAIL: JGIGANTIELLO@RDSOLAR.COM

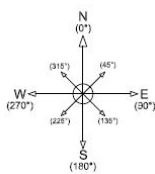


**ISSUE PURPOSE:**  
 DESIGN DEVELOPMENT  
 CONSTRUCTION  
 REVISION  
 RECORD

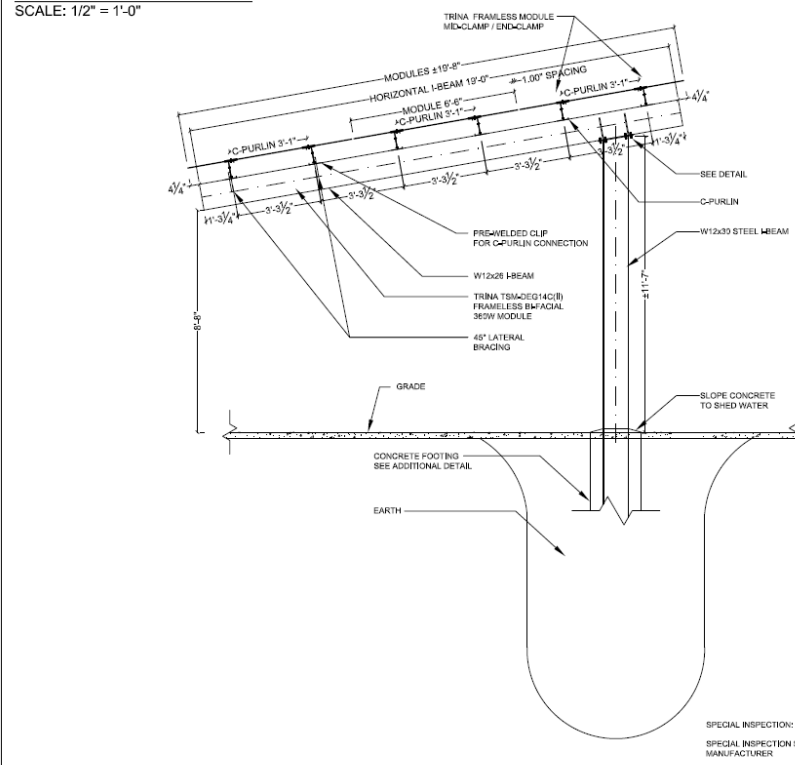
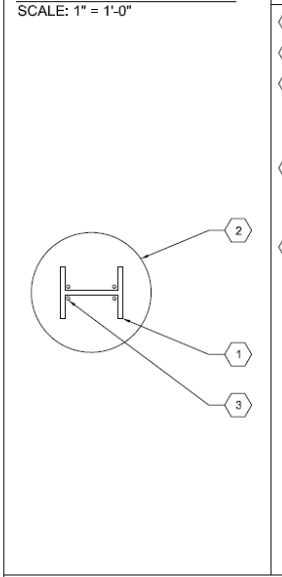




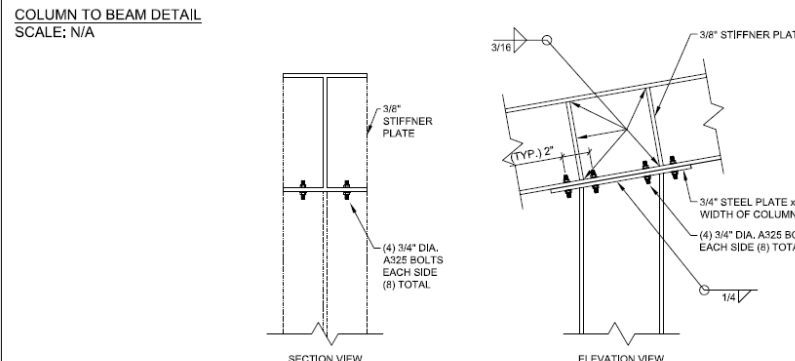
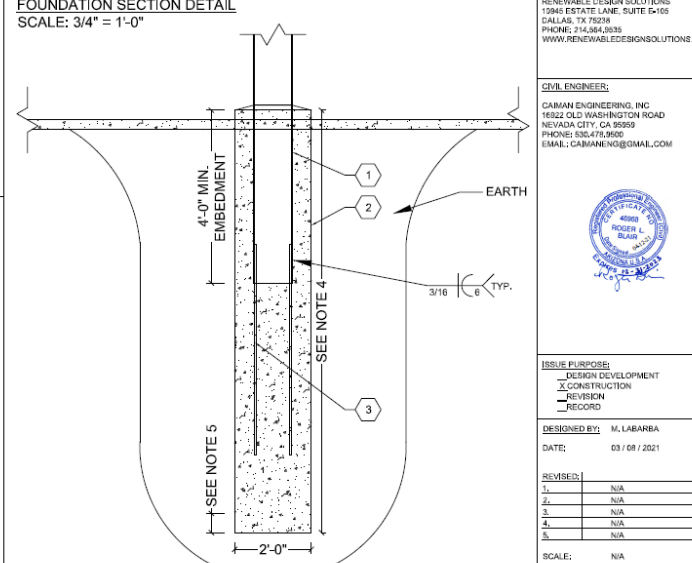
**DESIGNED BY:** M. LABARRA  
**DATE:** 03 / 08 / 2021

| REVISED: |     |
|----------|-----|
| 1.       | N/A |
| 2.       | N/A |
| 3.       | N/A |
| 4.       | N/A |
| 5.       | N/A |

**SCALE:** 1/16" = 1'-0"  
**PAPER SIZE:** 24" x 36"

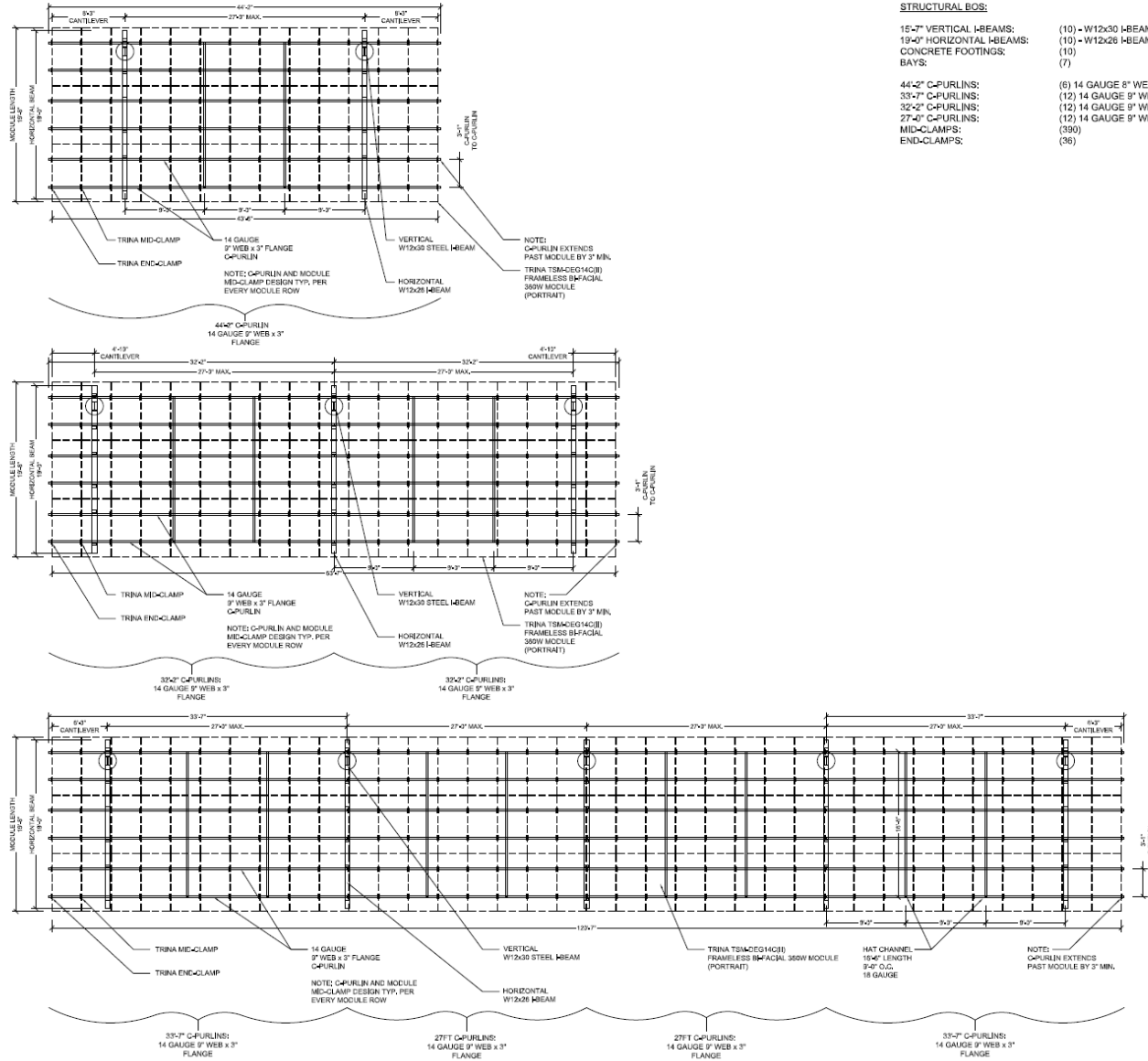


# San Xavier Solar Project – Education Building

|  |  |  |  |          |  |    |     |    |     |    |     |    |     |    |     |
|--|--|--|--|----------|--|----|-----|----|-----|----|-----|----|-----|----|-----|
| <p><b>STRUCTURAL ELEVATION DETAIL</b><br/>SCALE: 1/2" = 1'-0"</p>  <p><b>SPECIAL INSPECTION:</b><br/>SPECIAL INSPECTION SHALL BE CONDUCTED TO VERIFY BOLT TORQUE AS REQUIRED BY MANUFACTURER</p> | <p><b>FOUNDATION SECTION DETAIL</b><br/>SCALE: 1" = 1'-0"</p>     | <p><b>STRUCTURAL NOTES:</b></p> <ul style="list-style-type: none"> <li>① STEEL COLUMN</li> <li>② CAST-IN-PLACE CONCRETE DRILLED PIER</li> <li>③ (2) #8 BARS ON EACH SIDE OF STEEL COLUMN OR EMBED COLUMN INTO CONCRETE DRILLED PIER TO WITHIN 3" MIN. -12" MAX OF THE BOTTOM OF THE CONCRETE DRILLED PIER AND OMIT REBAR</li> <li>④ 24" DIAMETER DRILLED PIER DEPTH:             <ul style="list-style-type: none"> <li>• 11'-2" AT DIRT AREA</li> </ul> </li> <li>⑤ 3' MIN. -12" MAX</li> </ul> | <p><b>PHOTOVOLTAIC PROJECT INFORMATION:</b></p> <p>73.68 KW (DC) - 66.6 KW (AC)<br/>PV UTILITY INTERACTIVE SYSTEM<br/>SAN XAVIER EDUCATION BUILDING<br/>1965 ESTATE LANE<br/>TUCSON, AZ 85746<br/>AHL: TOHONG O'OHAM NATION UTILITY TOHA</p> <p><b>PROJECT NUMBER:</b><br/>4523-113</p> <p><b>PROJECT SHEET:</b><br/>L-2B</p> <p><b>SHEET TITLE:</b><br/>STRUCTURAL LAYOUT WITH MECHANICAL DETAIL</p> <div style="text-align: center;"> <br/> <small>PROJECT DEVELOPER:</small><br/> <small>RDS DEVCO</small><br/> <small>10945 ESTATE LANE, SUITE 6-100</small><br/> <small>DALLAS, TX 75228</small><br/> <small>PHONE: 214.664.2633</small><br/> <small>WWW.RENEWABLEDESIGNSOLUTIONS.COM</small> </div> <div style="text-align: center;"> <br/> <small>INSTALLATION CONTRACTOR:</small><br/> <small>RDS SOLAR &amp; ELECTRIC, L.L.C.</small><br/> <small>10945 ESTATE LANE, SUITE 6-100</small><br/> <small>DALLAS, TX 75228</small><br/> <small>PHONE: 214.664.2633</small><br/> <small>NABCEP #: 101915462701</small><br/> <small>AZROC #: 324618 CR-1</small> </div> <div style="text-align: center;"> <br/> <small>SOLAR PV CONSULTANT:</small><br/> <small>RENEWABLE DESIGN SOLUTIONS</small><br/> <small>1965 ESTATE LANE, SUITE 6-100</small><br/> <small>DALLAS, TX 75228</small><br/> <small>PHONE: 214.664.2633</small><br/> <small>WWW.RENEWABLEDESIGNSOLUTIONS.COM</small> </div> <p><b>CIVIL ENGINEER:</b><br/> <small>CARMAN ENGINEERING, INC</small><br/> <small>16922 OLD WASHINGTON ROAD</small><br/> <small>NEVADA CITY, CA 95959</small><br/> <small>PHONE: 530.475.9600</small><br/> <small>EMAIL: CARMANENG@GMAIL.COM</small></p> <div style="text-align: center;">  </div> <p><b>ISSUE PURPOSE:</b><br/> <input type="checkbox"/> DESIGN DEVELOPMENT<br/> <input checked="" type="checkbox"/> CONSTRUCTION<br/> <input type="checkbox"/> REVISION<br/> <input type="checkbox"/> RECORD</p> <p><b>DESIGNED BY:</b> M. LABARRA<br/> <b>DATE:</b> 03 / 08 / 2021</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>REVISED:</td><td></td></tr> <tr><td>1.</td><td>N/A</td></tr> <tr><td>2.</td><td>N/A</td></tr> <tr><td>3.</td><td>N/A</td></tr> <tr><td>4.</td><td>N/A</td></tr> <tr><td>5.</td><td>N/A</td></tr> </table> <p><b>SCALE:</b> N/A<br/> <b>PAPER SIZE:</b> 24" x 36"</p> | REVISED: |  | 1. | N/A | 2. | N/A | 3. | N/A | 4. | N/A | 5. | N/A |
| REVISED:   |  |  |  |          |  |    |     |    |     |    |     |    |     |    |     |
| 1.   | N/A  |  |  |          |  |    |     |    |     |    |     |    |     |    |     |
| 2.   | N/A  |  |  |          |  |    |     |    |     |    |     |    |     |    |     |
| 3.   | N/A  |  |  |          |  |    |     |    |     |    |     |    |     |    |     |
| 4.   | N/A  |  |  |          |  |    |     |    |     |    |     |    |     |    |     |
| 5.   | N/A  |  |  |          |  |    |     |    |     |    |     |    |     |    |     |
| <p><b>COLUMN TO BEAM DETAIL</b><br/>SCALE: N/A</p>    | <p><b>FOUNDATION SECTION DETAIL</b><br/>SCALE: 3/4" = 1'-0"</p>  |  |  |          |  |    |     |    |     |    |     |    |     |    |     |

# San Xavier Solar Project – Education Building

**STRUCTURAL DETAIL**  
SCALE: 3/16" = 1'-0"



- STRUCTURAL BOS:**
- 15'-7" VERTICAL I-BEAMS: (10) - W12x30 I-BEAM
  - 19'-0" HORIZONTAL I-BEAMS: (10) - W12x26 I-BEAM
  - CONCRETE FOOTINGS: (10)
  - BAYS: (7)
  - 44'-2" C-PURLINS: (6) 14 GAUGE 9" WEB x 3" FLANGE
  - 33'-7" C-PURLINS: (12) 14 GAUGE 9" WEB x 3" FLANGE
  - 32'-2" C-PURLINS: (12) 14 GAUGE 9" WEB x 3" FLANGE
  - 27'-0" C-PURLINS: (12) 14 GAUGE 9" WEB x 3" FLANGE
  - MID-CLAMPS: (390)
  - END-CLAMPS: (36)

**PHOTOVOLTAIC PROJECT INFORMATION:**

73.08 KW (DC) + 60.0 KW (AC)  
PV UTILITY INTERACTIVE SYSTEM  
SAN XAVIER EDUCATION BUILDING  
1905 WAK LANE  
TUCSON, AZ 85716  
AHJ: TONONO O'CHAM NATION  
UTILITY: TOLU

PROJECT NUMBER: 4523-113

PROJECT SHEET: L-2D

SHEET TITLE:  
STRUCTURAL LAYOUT  
WITH MECHANICAL  
DETAIL



PROJECT DEVELOPER:  
RDS DEVCO  
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DALLAS, TX 75238  
PHONE: 214.564.9535  
WWW.RENEWABLEDESIGNSOLUTIONS.COM

**RDS SOLAR & ELECTRIC**

INSTALLATION CONTRACTOR:  
RDS SOLAR & ELECTRIC, LLC  
10345 ESTATE LANE, SUITE 6-105  
DALLAS, TX 75238  
PHONE: 214.564.9535  
NABCEP # 101375462701  
AZNOC # 324818 GR-11



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**CIVIL ENGINEER:**

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PHONE: 530.478.9600  
EMAIL: CABIANENG@GMAIL.COM



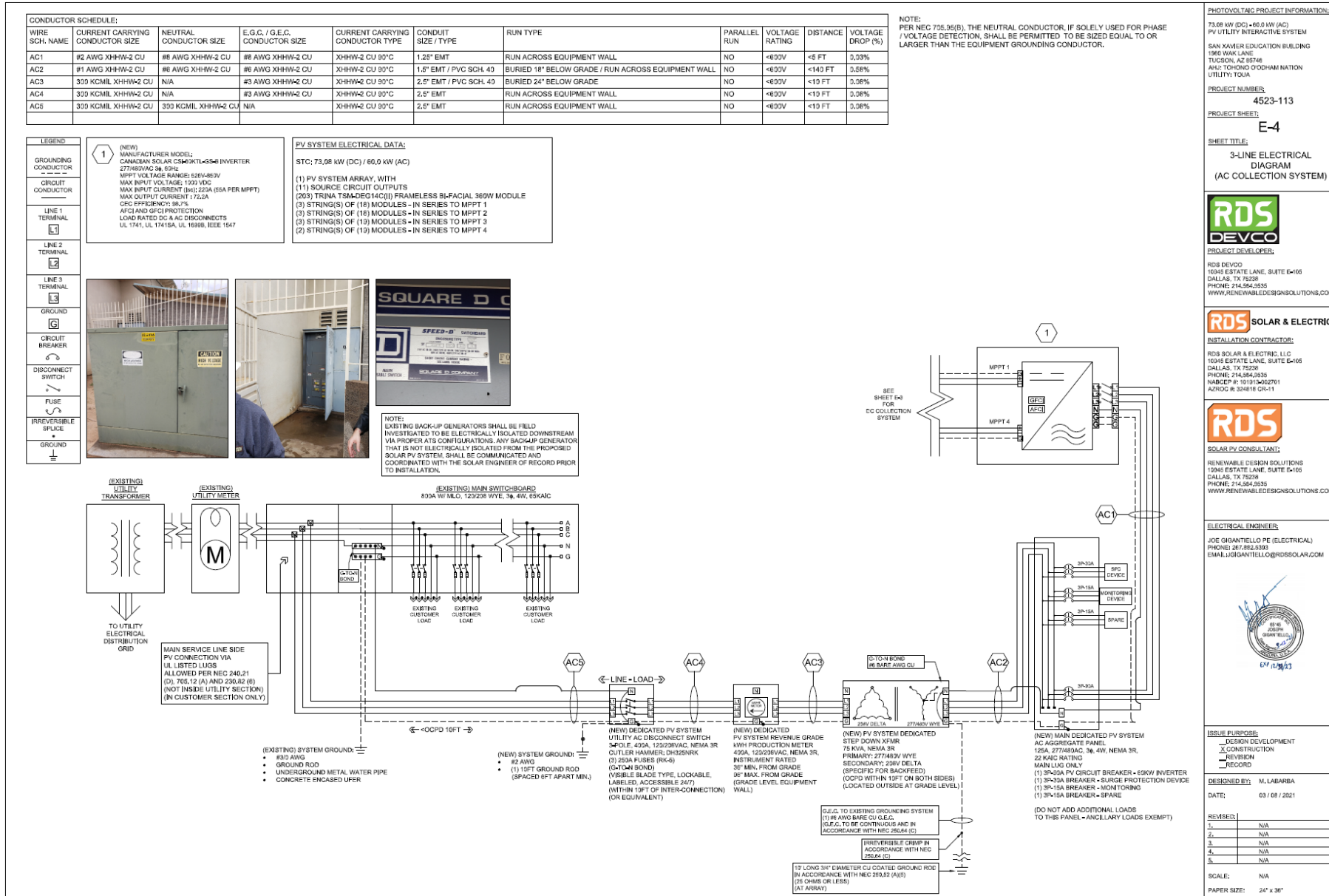
ISSUE PURPOSE:  
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 RECORD

DESIGNED BY: M. LABARRA  
DATE: 03 / 08 / 2021

| REVISION: |     |
|-----------|-----|
| 1.        | N/A |
| 2.        | N/A |
| 3.        | N/A |
| 4.        | N/A |
| 5.        | N/A |

SCALE: 1" = 10'  
PAPER SIZE: 24" x 36"

# San Xavier Solar Project – Education Building



# San Xavier Solar Project – Education Building



# San Xavier Solar Project – Education Building



# San Xavier Solar Project – Education Building



# San Xavier Solar Project – Education Building







## ***RENEWABLE DESIGN SOLUTIONS***

***Solar PV Design, Energy Storage and Renewable Development***





## **RENEWABLE DESIGN SOLUTIONS**

***Solar PV Design, Energy Storage and Renewable Development***

### ***Who we are:***

RDS is a privately-owned solar PV design and consulting firm based in Dallas, Texas. Comprised of a diverse group of solar designers and engineers, RDS has consulted over 1.6 gigawatts of utility scale, C&I and micro-grid projects. RDS maintains degreed engineers, master electricians and NABCEP certified design professionals with over 80 years of combined solar experience. RDS also provides electrical, structural and civil PE services in 38 States.

### ***Who we work with:***

- **Architects**
- **Engineers**
- **Solar PV Developers and Installers**
- **Electrical Contractors**
- **General Contractors**
- **Utilities**
- **Municipalities**
- **Non-Profits**
- **Solar and Electrical Distributers**



### ***Experience:***

Through superior communication, accelerated project completion, and unprecedented client satisfaction, RDS has designed, permitted and consulted over \$1 Billion of renewable distributed generation assets.



## **RENEWABLE DESIGN SOLUTIONS**

***Solar PV Design, Energy Storage and Renewable Development***

### ***RDS Solar PV Design Services:***

***Comprehensive Solar PV Design Package (commercial and residential)***

- **Map Plans**
- **Site Plans**
- **Structural / Mechanical Plans**
- **String Sizing / Electrical Specifications**
- **One-Line Electrical Diagrams**
- **Three-Line Electrical Diagrams**
- **Safety Labeling Diagrams**
- **Voltage Drop Calculations**
- **Correlating PV Equipment Specifications**
- **Value Engineering**
- **Utility Submittals**
- **Start to Finish Project Consulting**

#### **Insurance:**

- **E&O policy (Lloyd's of London) - \$2 million per claim / \$ 2 million aggregate**
- **General Liability - \$2 million per claim / \$ 2 million aggregate**
- **Excess Liability - \$2 million per claim / \$ 2 million aggregate**
- **Worker's Compensation - \$1 million per claim / \$ 1 million aggregate**

#### ***Professional Engineer Services***

- |                         |                             |
|-------------------------|-----------------------------|
| • <b>Hawaii</b>         | • <b>Alabama</b>            |
| • <b>Oregon</b>         | • <b>New Jersey</b>         |
| • <b>California</b>     | • <b>Pennsylvania</b>       |
| • <b>Nevada</b>         | • <b>Delaware</b>           |
| • <b>Arizona</b>        | • <b>Maryland</b>           |
| • <b>New Mexico</b>     | • <b>Virginia</b>           |
| • <b>Texas</b>          | • <b>New York</b>           |
| • <b>North Dakota</b>   | • <b>Rhode Island</b>       |
| • <b>Kansas</b>         | • <b>Massachusetts</b>      |
| • <b>Louisiana</b>      | • <b>Ohio</b>               |
| • <b>Missouri</b>       | • <b>Illinois</b>           |
| • <b>Tennessee</b>      | • <b>Tennessee</b>          |
| • <b>North Carolina</b> | • <b>38+ State Licenses</b> |
| • <b>South Carolina</b> |                             |
| • <b>Georgia</b>        |                             |
| • <b>Florida</b>        |                             |





# RENEWABLE DESIGN SOLUTIONS

**Solar PV Design, Energy Storage and Renewable Development**

## Highlighted Projects

### Utility Scale PV Projects:

- Project Gemini - 966 MW (DC) / 1,416 MWH of Energy Storage  
Las Vegas, NV
- North Carolina Portfolio - 176 MW (DC)  
Location Confidential
- New England Portfolio - 83 MW (DC) W/ 44MWH Energy Storage  
Location Confidential
- East Coast Portfolio - 30 MW (DC)  
Location Confidential
- Oil & Gas Portfolio - 26 MW (DC)  
Bakersfield, CA
- Duke Utility Energy Storage Portfolio – 13.2 MWH (DC) / 13.2 MW (AC) (in progress)  
Location Confidential
- Portland Gas & Electric Energy Storage 8.528 MWH (DC) / 6MW (AC) (in progress)  
Location Confidential

### 3<sup>rd</sup> Party Commissioning:

- G.W. Bush Library – 200 KW (DC) – Dallas, TX

### Notable Statistics:

- Designed the largest energy storage system in the world & largest solar PV system in America.
- Designed and consulted more commercial micro-inverter systems than any other solar PV design firm.
- With 1.6 GW of combined, utility, commercial, residential and off-grid experience, RDS has designed and consulted more solar than any other firm in Texas.

### Commercial PV Projects:

- Illinois Portfolio – 15 MW (DC)  
Various locations in Illinois
- E&B Resources – 22 MW (DC)  
Bakersfield, CA
- Taylor Farms (Mexico) – 2.6 MW (DC)  
Central Mexico
- Accesso Office Complex– 2.428 MW (DC)  
Austin, TX
- Intuit Corporate Offices – 1.598 MW (DC)  
Tucson, AZ
- Finrock Construction – 1.336 MW (DC)  
Apopka, FL
- McAllen Solar – 1.22 MW (DC)  
McAllen, TX
- Worldpack Cold Storage Facility – 690.30 KW (DC)  
Gloucester City, NJ
- Crescent Crown Mesa – 619.83 KW (DC)  
Mesa, AZ
- Balanced Body (Distribution Center) – 250.0 KW (DC)  
Sacramento, CA
- Whole Foods (Domain) - 187.38 KW (DC)  
Austin, TX
- Booneville Natural Gas – 107.73 KW (DC)  
Booneville, IN
- Alberici Construction (Headquarters) – 99.84 KW (DC)  
St. Louis, MO
- Alamo Brewery – 99.50 KW (DC)  
San Antonio, TX
- Bear Republic Brewery – 114.80 KW (DC)  
Cloverdale, CA
- San Antonio Portfolio – 1.2 MW (DC)  
(portfolio of storage facilities, gas station canopies, commercial buildings)  
San Antonio, TX
- Dallas Portfolio – 1.4 MW (DC)  
(portfolio of solar carports and apartment complexes)  
Dallas, TX



# RENEWABLE DESIGN SOLUTIONS

**Solar PV Design, Energy Storage and Renewable Development**

## Highlighted Projects

### Industrial / Agricultural PV Projects:

- **Iowa Portfolio - 53 MW (DC)**  
(53 mW portfolio of pork, turkey and agricultural facilities)  
Iowa, USA
- **Strain Ranches - 902 KW (DC)**  
(Largest Micro-Inverter Project in the World on (1) inter-connection)  
Arbuckle, CA
- **Artois Feed - 534.24 KW (DC)**  
(Largest Enphase M250 Project in the World)  
Arbuckle, CA  
Artois, CA
- **El Camino Irrigation District - 356.40 KW (DC)**  
Gerber, CA
- **Dan Best Ranches – 561.74 KW (DC)**  
(Founding family of Caterpillar, Inc)  
Woodland, CA
- **Tadlock Farms – 150.185 KW (DC)**  
Zamora, CA
- **Joe Muller & Sons Farms – 102.0 KW (DC)**  
Woodland, CA
- **Crown Nursery – 171.0 KW (DC)**  
Red Bluff, CA
- **Smith Ranches – 175.0 KW (DC)**  
Woodland, CA
- **Whyler Company – 302.40 KW (DC)**  
Glenn, CA
- **C F Koehnen and Sons, Inc. – 102.45 KW (DC)**  
Glenn, CA
- **Oakdale Cheese & Specialties. – 68.20 KW (DC)**  
Oakdale, CA
- **Da Silva Dairy Farms – 700.60 KW (DC)**  
Escalon, CA

### Government / Institutional PV Projects:

- **Joint Base San Antonio - 18 MW (DC) (in progress)**  
San Antonio, TX
- **Quantico Marine Base - 576.24 KW (DC)**  
Quantico, VA
- **El Camino Irrigation District - 356.40 KW (DC)**  
Gerber, CA
- **San Francisco Municipal Transportation Agency (Islais Creek) – 316.51 KW (DC)**  
San Francisco, CA
- **San Antonio Children's Museum – 172.48 KW (DC)**  
San Antonio, TX
- **Palo Alto Veterans Affairs Hospital – 39.0 KW (DC)**  
Palo Alto, CA
- **Willie Brown Middle School – 140.21 KW (DC)**  
San Francisco, CA
- **George Washington Carver Museum and Library - 105.84 KW (DC)**  
Austin, TX
- **United States Army Reserve Center – 85.12 KW (DC)**  
San Marcos, TX
- **Austin Bergstrom Airport – 74.88 KW (DC)**  
Austin, TX
- **Cochiti Facility – US Army Core of Engineers – 65.34 KW (DC)**  
Chociti Lake, NM
- **U.S. Navy – Naval Facilities Engineering Command – 33.0 KW(DC)**  
Portsmouth, VA
- **Los Angeles City College – 20.40 KW (DC)**  
Los Angeles, CA
- **University of California (Irvine) – 55.0 KW (DC)**  
Irvine, CA
- **Chicago Botanical Gardens – 23.20 KW (DC)**  
Chicago, IL
- **San Antonio Botanical Gardens – 30.0 KW (DC)**  
San Antonio, TX
- **Hanscom Air Force Base – 6.0 KW (DC)**  
Bedford, MA



# RENEWABLE DESIGN SOLUTIONS

**Solar PV Design, Energy Storage and Renewable Development**

## Highlighted Projects

### Off-grid / Battery Back-up / Micro-grid PV Projects:

- Leonardo DiCaprio's private island (Bahamas)
- GT Bank battery back-up project (Nigeria)
- Eco Bank battery back-up project (Nigeria)
- Total S. A. Gas Station Micro-Grid project 50KWH ESS, 60 KW (DC) Solar project (Nigeria).
- 634 KW (DC) PV Micro-grid project with 1.00 MW of capstone turbines and 500 KW of Tesla Power Pack (St. Croix, USVI)
- Robert Madonna (CEO of Savant, former President of Excel Switching Corp.) Residence. 205.50 KWH (DC) ESS / 29.12 KW (DC) Solar project (Hyannis, MA)
- Confidential Co-founder of Sun Micro Systems Residence 205.50 KWH (DC) ESS / 25.0 KW (DC) Solar project (Timber Cove, CA)

### Energy Storage / Demand Response / Frequency Control Projects:

- 8.8MWH / 8.8MW Duke – Asheville ESS Storage Project Asheville , NC
- Confidential development of bi-directional inverter, battery storage systems with grid responsive technology. Partners included Rexel USA, Gexpro Energy Solutions, LG Chem, and Ideal Power
- Home Depot – 270 KWH ESS System Lihue, HI
- Primus Power Flow Battery – 30 KWH ESS System Rancho Cucamonga , CA
- DHX – 135 KWH ESS System San Diego , CA

### Non-Profit / Community Service PV Projects:

- Habitat for Humanity Denton, TX
- The Brookwood Community (Educational facility for adults with disabilities and special needs) Brookshire, TX
- Serve Denton (Non-profit for helping families become self-sufficient) (WFAA Project Green Project Award Winner) Denton, TX

### Hospital / Medical Facility PV Projects:

- Oroville Hospital – 128.0 KW (DC) Oroville, CA
- Palo Alto Veterans Affairs Hospital – 39.0 KW (DC) Palo Alto, CA

### Religious PV Projects:

- Dharma Realm Buddhist Association – 510.40 KW (DC) (World's first Medium Voltage Micro-Inverter system in the World) Ukiah, CA
- Beth Israel Synagogue – 189.0 KW (DC) San Diego, CA
- Duncan Memorial Church – 112.20 KW (DC) Ashland, VA



## ***RENEWABLE DESIGN SOLUTIONS***

***Solar PV Design, Energy Storage and Renewable Development***

### ***Contact Info***

**Michael LaBarba**  
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NABCEP PV Installer  
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NCI Charrette Manager

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[www.renewabledesignsolutions.com](http://www.renewabledesignsolutions.com)

