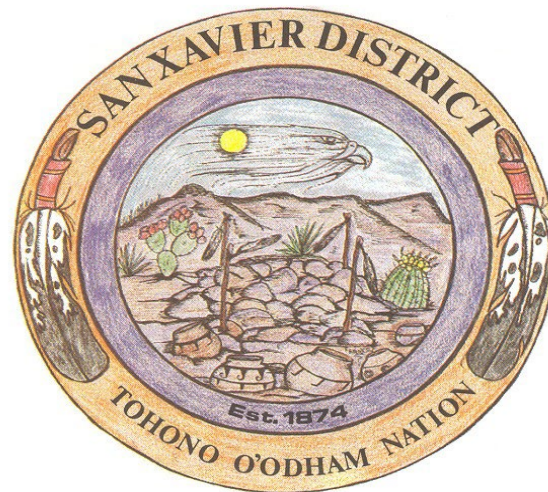


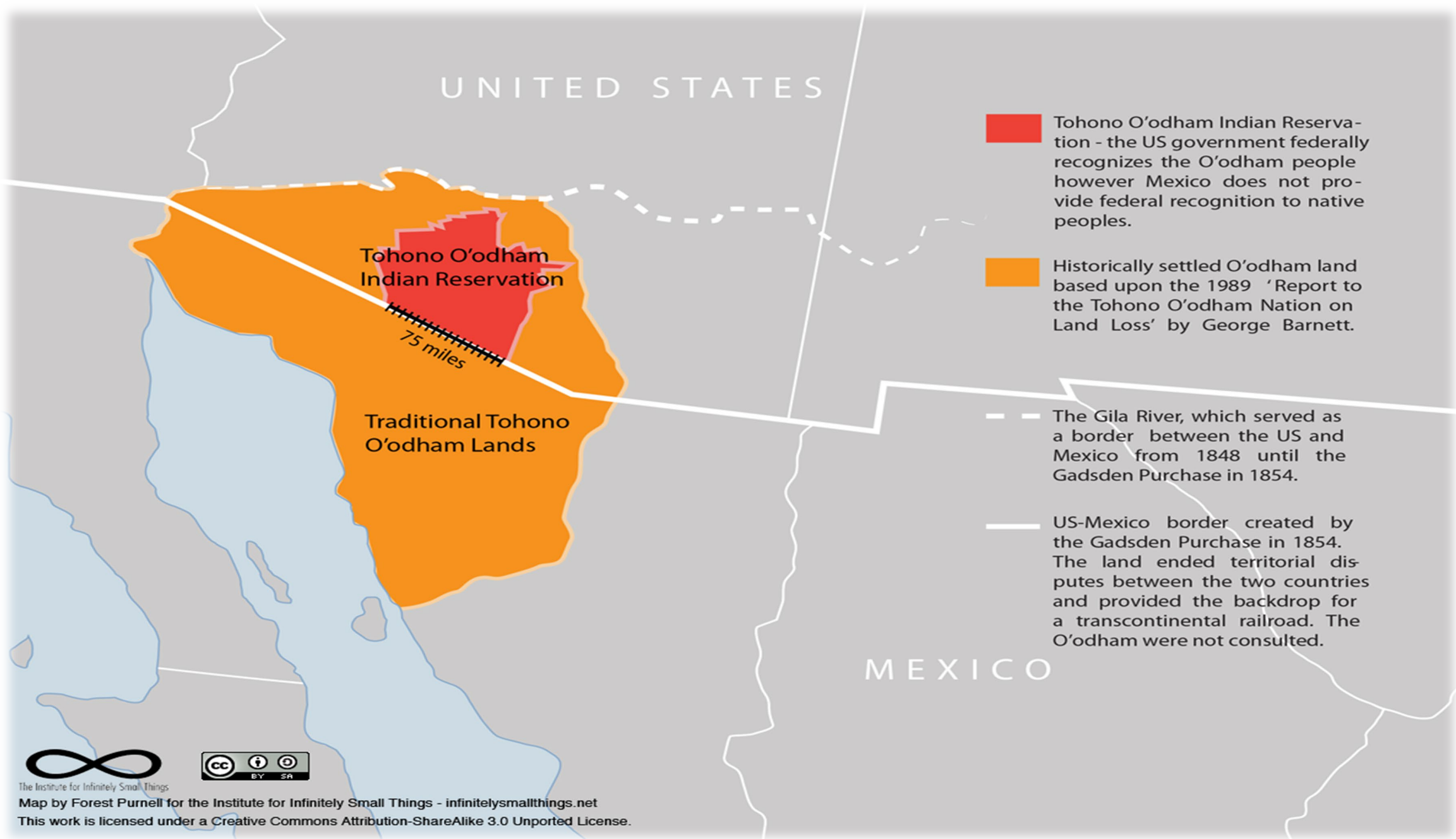
# Overview of San Xavier District (Wa:k Ceksan) of the Tohono O'odham Nation

Sandi Alvarez – Director of Administration

John Baskett – Principal Planner

Richard Grijalva – Director of Economic Development





UNITED STATES

**Red** Tohono O'odham Indian Reservation - the US government federally recognizes the O'odham people however Mexico does not provide federal recognition to native peoples.

**Orange** Historically settled O'odham land based upon the 1989 'Report to the Tohono O'odham Nation on Land Loss' by George Barnett.

Tohono O'odham Indian Reservation

75 miles

Traditional Tohono O'odham Lands

**Dashed line** The Gila River, which served as a border between the US and Mexico from 1848 until the Gadsden Purchase in 1854.

**Solid line** US-Mexico border created by the Gadsden Purchase in 1854. The land ended territorial disputes between the two countries and provided the backdrop for a transcontinental railroad. The O'odham were not consulted.

MEXICO

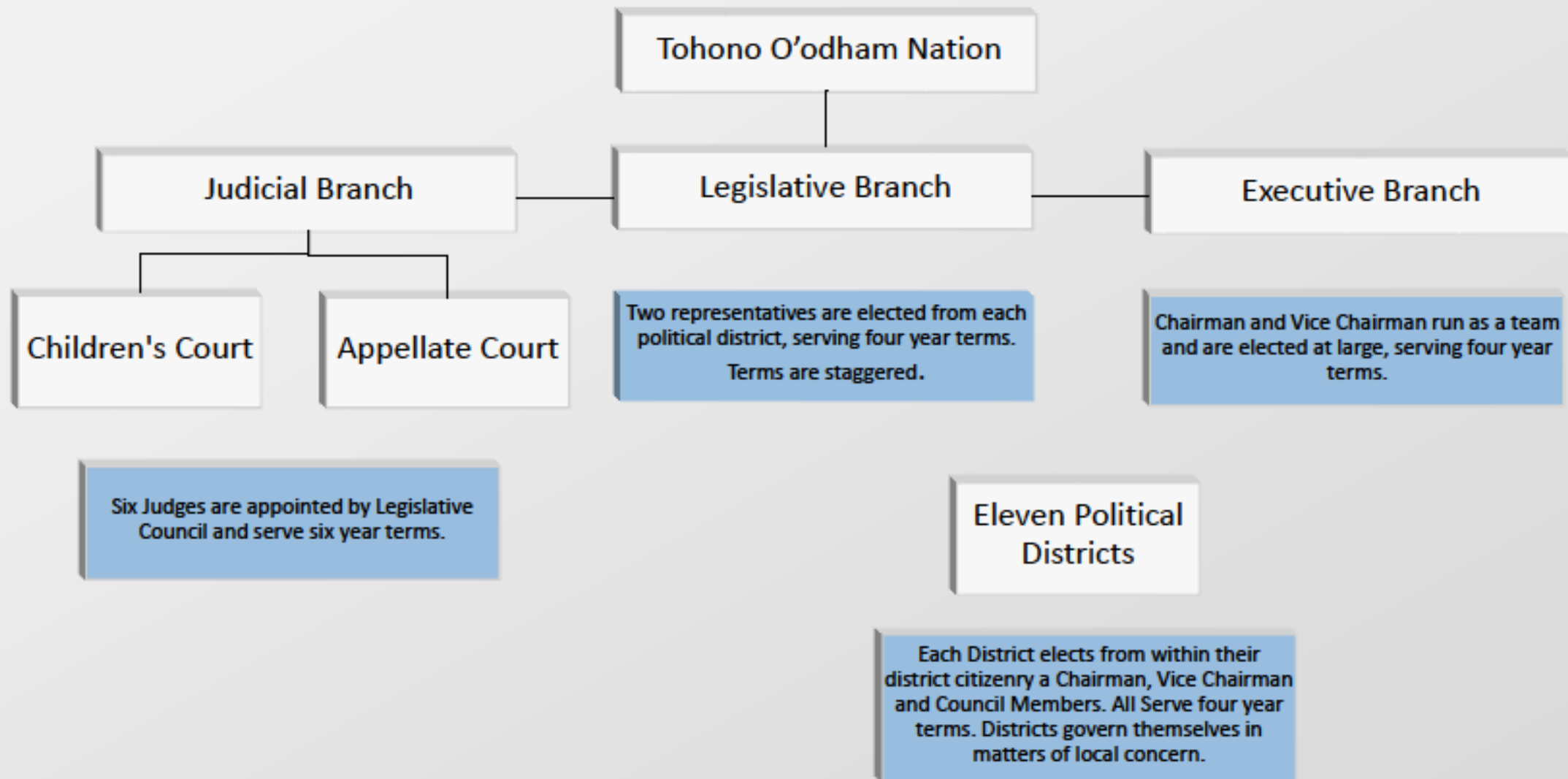


The Institute for Infinitely Small Things



Map by Forest Purnell for the Institute for Infinitely Small Things - [infinitelysmallthings.net](http://infinitelysmallthings.net)

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Tohono O'odham Nation

Judicial Branch

Legislative Branch

Executive Branch

Children's Court

Appellate Court

Two representatives are elected from each political district, serving four year terms. Terms are staggered.

Chairman and Vice Chairman run as a team and are elected at large, serving four year terms.

Six Judges are appointed by Legislative Council and serve six year terms.

Eleven Political Districts

Each District elects from within their district citizenry a Chairman, Vice Chairman and Council Members. All Serve four year terms. Districts govern themselves in matters of local concern.

# 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



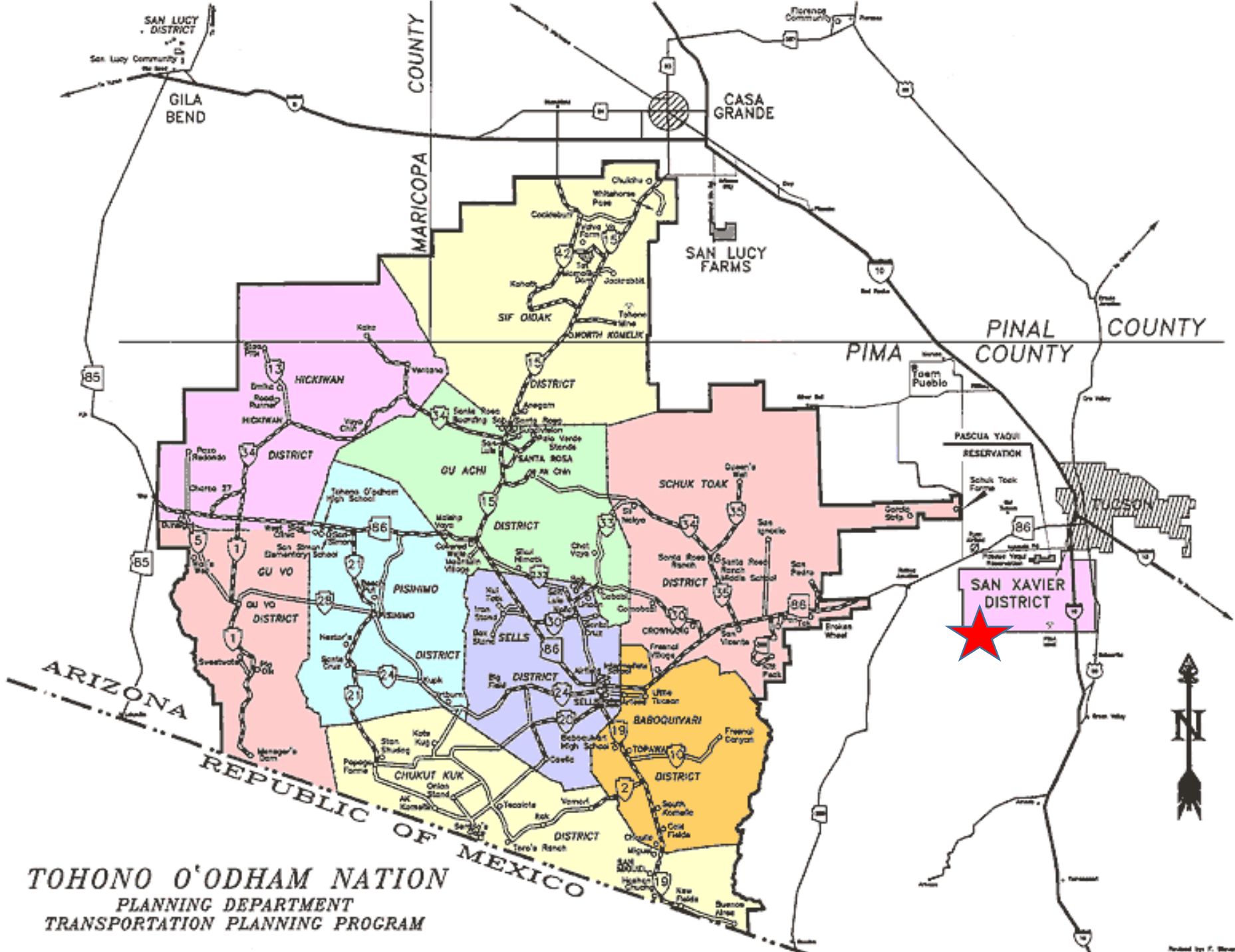
**Sells District**  
Enrollment: 5,471



**Pisinemo District**  
Enrollment: 2,307

**TOTAL = 31,757**

May 2019



TOHONO O'ODHAM NATION  
 PLANNING DEPARTMENT  
 TRANSPORTATION PLANNING PROGRAM

# San Xavier District, Tohono O'odham

- Tohono O'odham ancestors - the Hohokam have resided at this location for centuries.
- The San Xavier Reservation was established in 1874 by an executive order.
- 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.



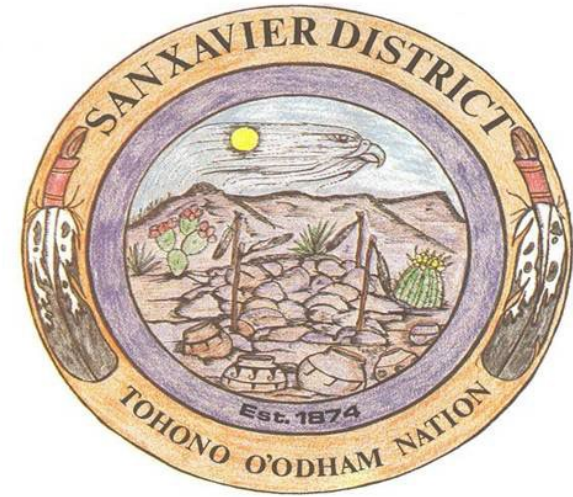
# San Xavier District, Tohono O'odham

- San Xavier is located approximately twelve miles south of downtown Tucson, Arizona.
- Total of 72,000 acres of Sonoran Desert
- 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.



# 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 community





# San Xavier Solar Project – District and Education Buildings

## The Overall Energy Goals:

- 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 solar projects were designed to produce energy over a 25-year horizon, free of charge except for operation and maintenance;
- v) Improve energy independence. The District heavily relies on non-renewable commercial power. The 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:

- 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.

# DOE Grant

- Awarded in 2020
- \$1,002,535
  - DOE Share 50% \$501,267
  - SXD Share 50% \$501,268
- Contracted with RDS (Renewable Design Solutions).
- Solar Arrays completed in October 2021
- Finished collecting 1 year data October 2022
- Final report to DOE December 2022

# San Xavier Solar Project – District and Education Buildings

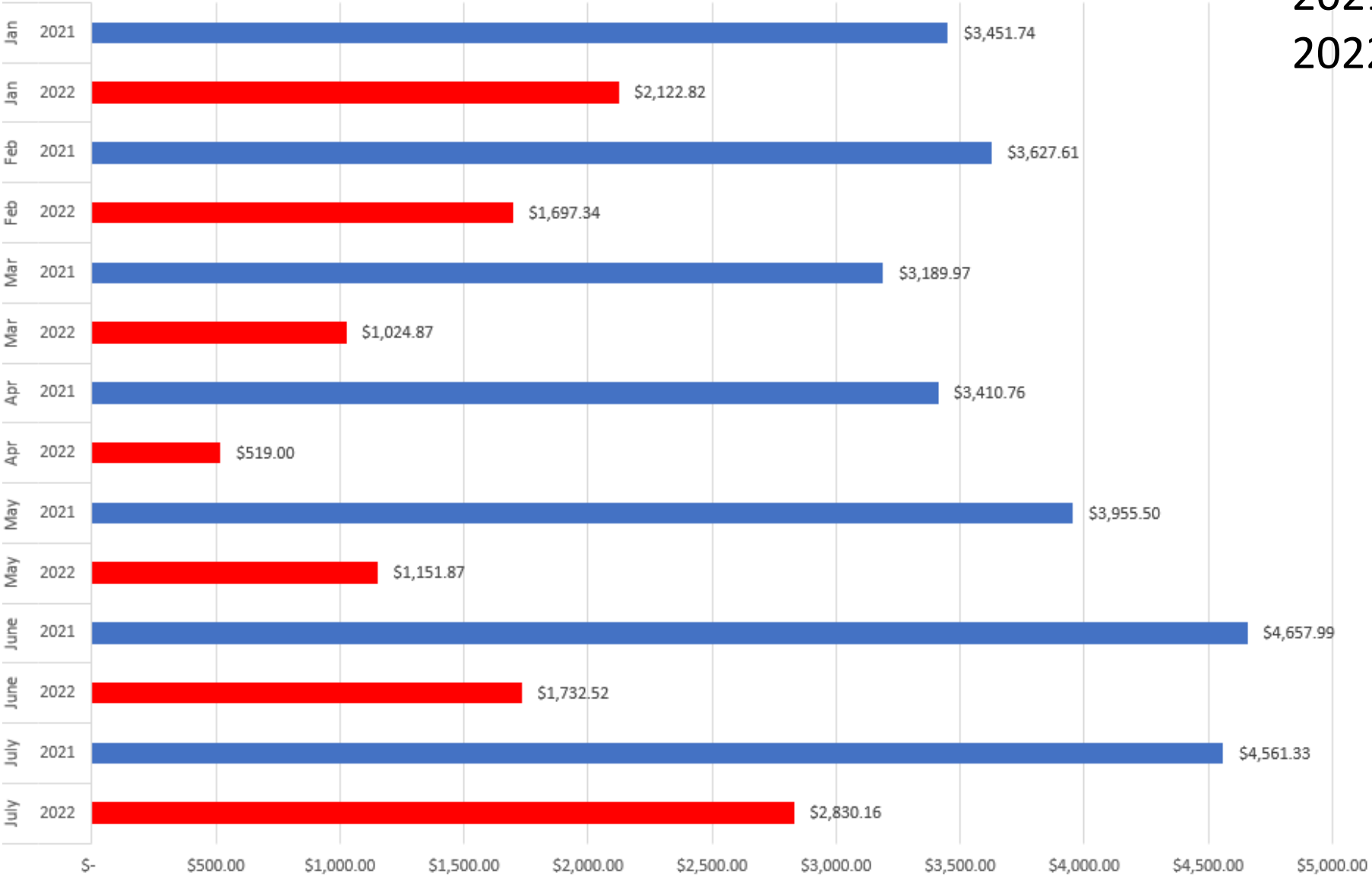
## Project Summary

- 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 District developed a 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. Electric bills about \$84,000 a year.
- 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

Administration Building Electric Bills 2022 vs. 2021

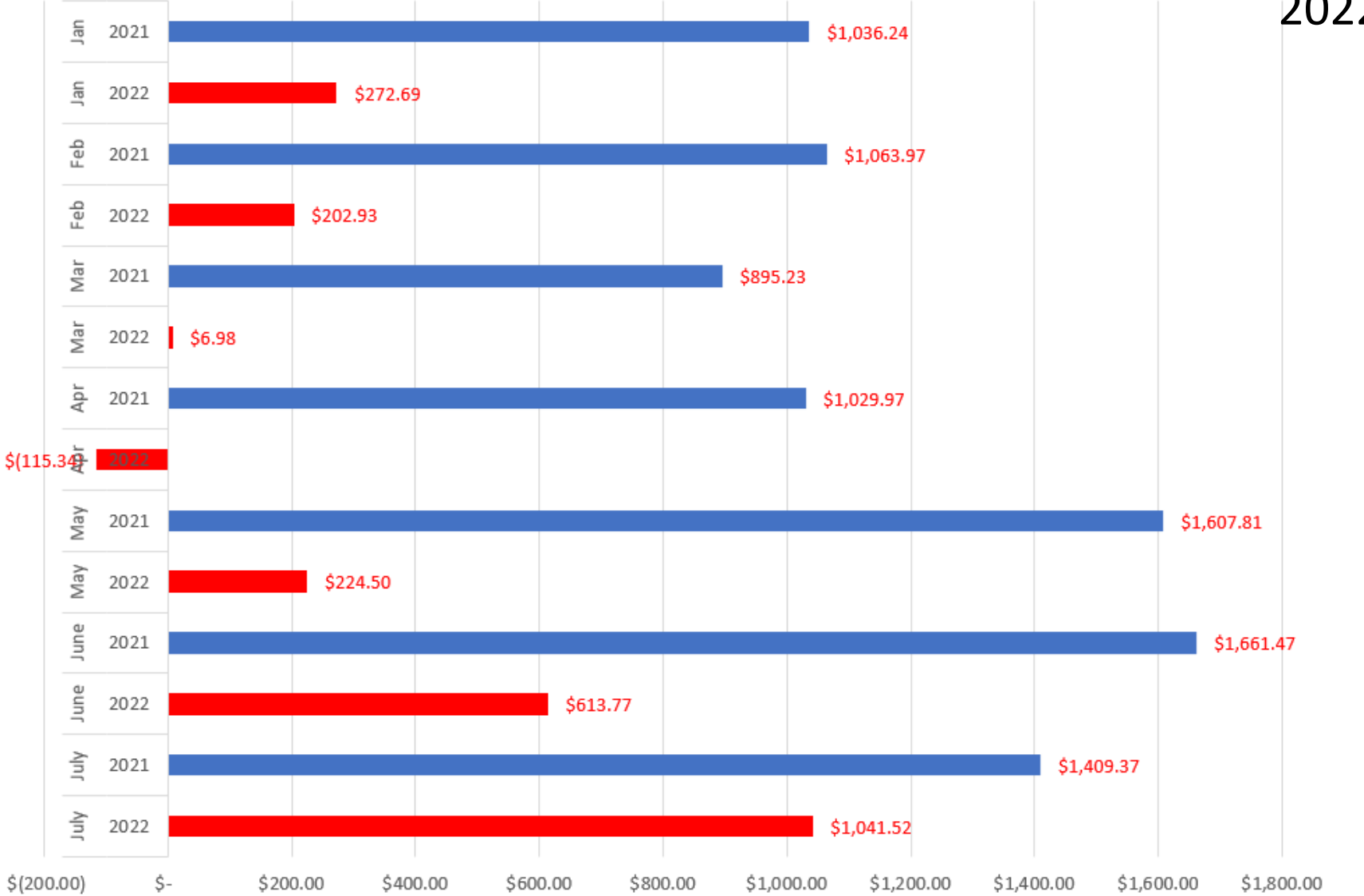
2021 = \$26,000  
2022 = \$11,000



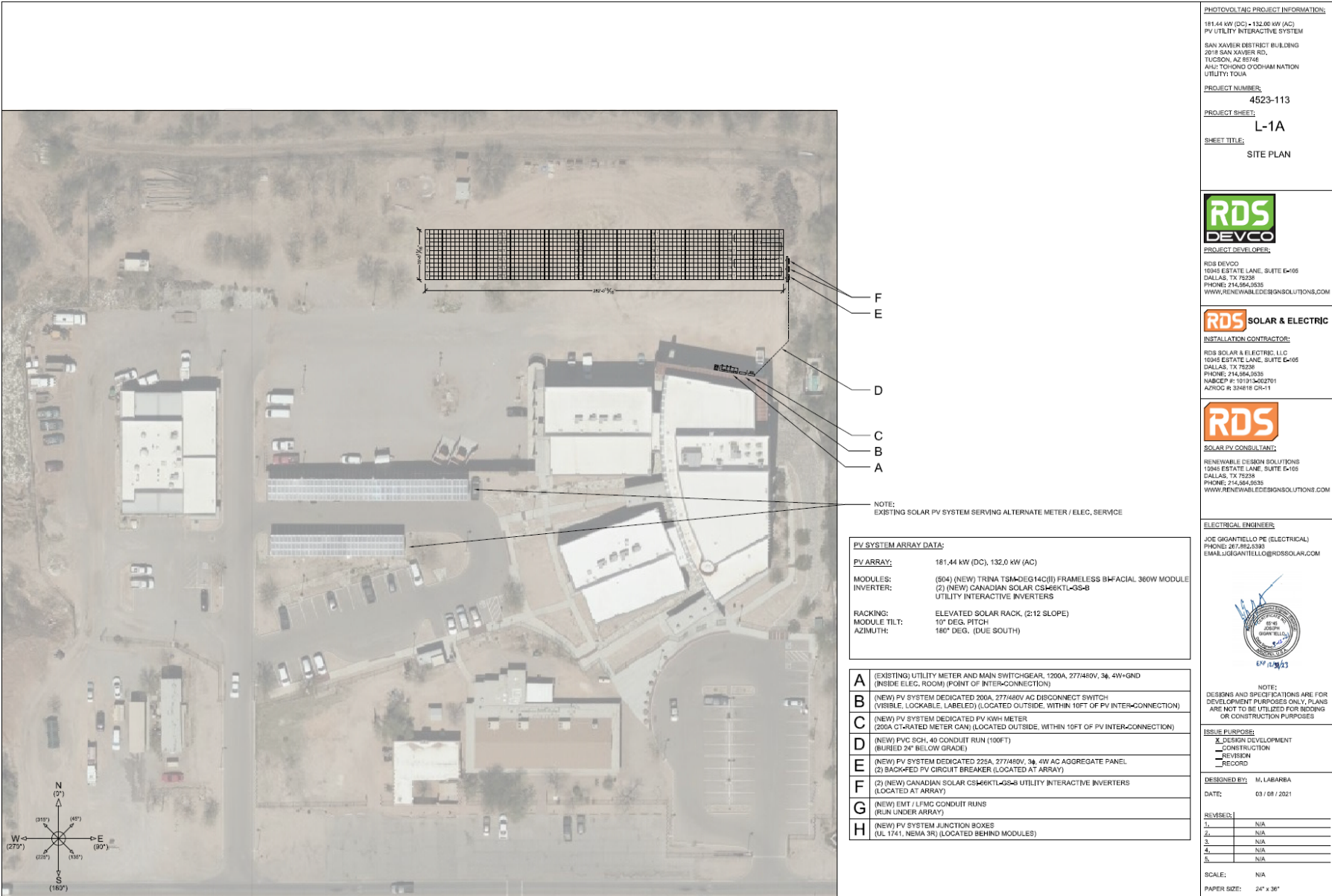
# San Xavier Solar Project

Education Building Electric Bills 2022 vs. 2021

2021 = \$8,700  
2022 = \$2,300



# 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/SONG O'DOHAM NATION  
 UTILITY: TCUA  
**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: 214.582.5393  
 EMAIL: JOEGIGANTELLO@RDSOLAR.COM

**NOTE:**  
 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

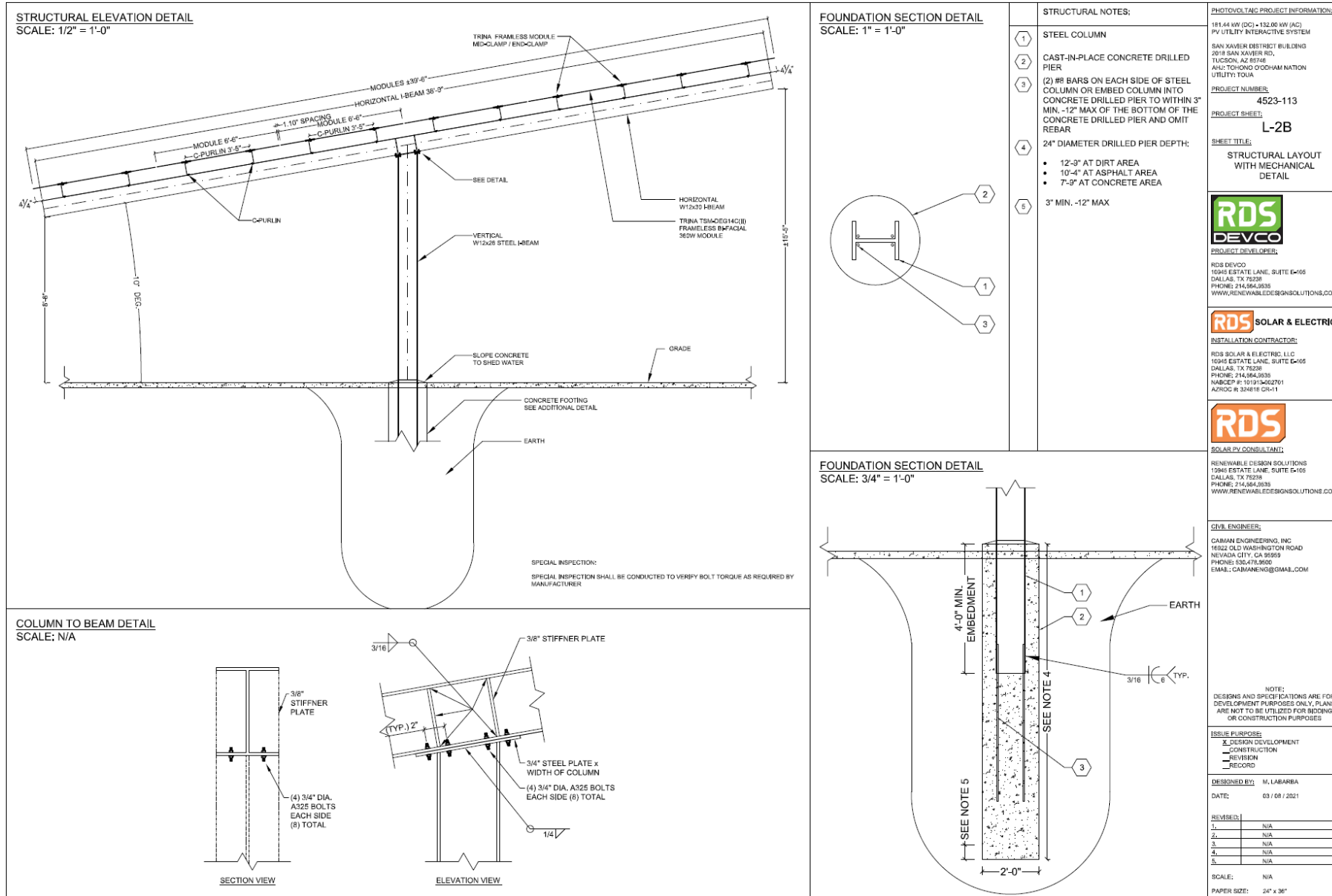
**SCALE:** N/A  
**PAPER SIZE:** 24" x 36"

**NOTE:**  
 EXISTING SOLAR PV SYSTEM SERVING ALTERNATE METER / ELEC. SERVICE

**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-B 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 INTERCONNECTION)
- C** (NEW) PV SYSTEM DEDICATED PV KWH METER (200A CT-RATED METER CAN) (LOCATED OUTSIDE, WITHIN 10FT OF PV INTERCONNECTION)
- 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-B 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





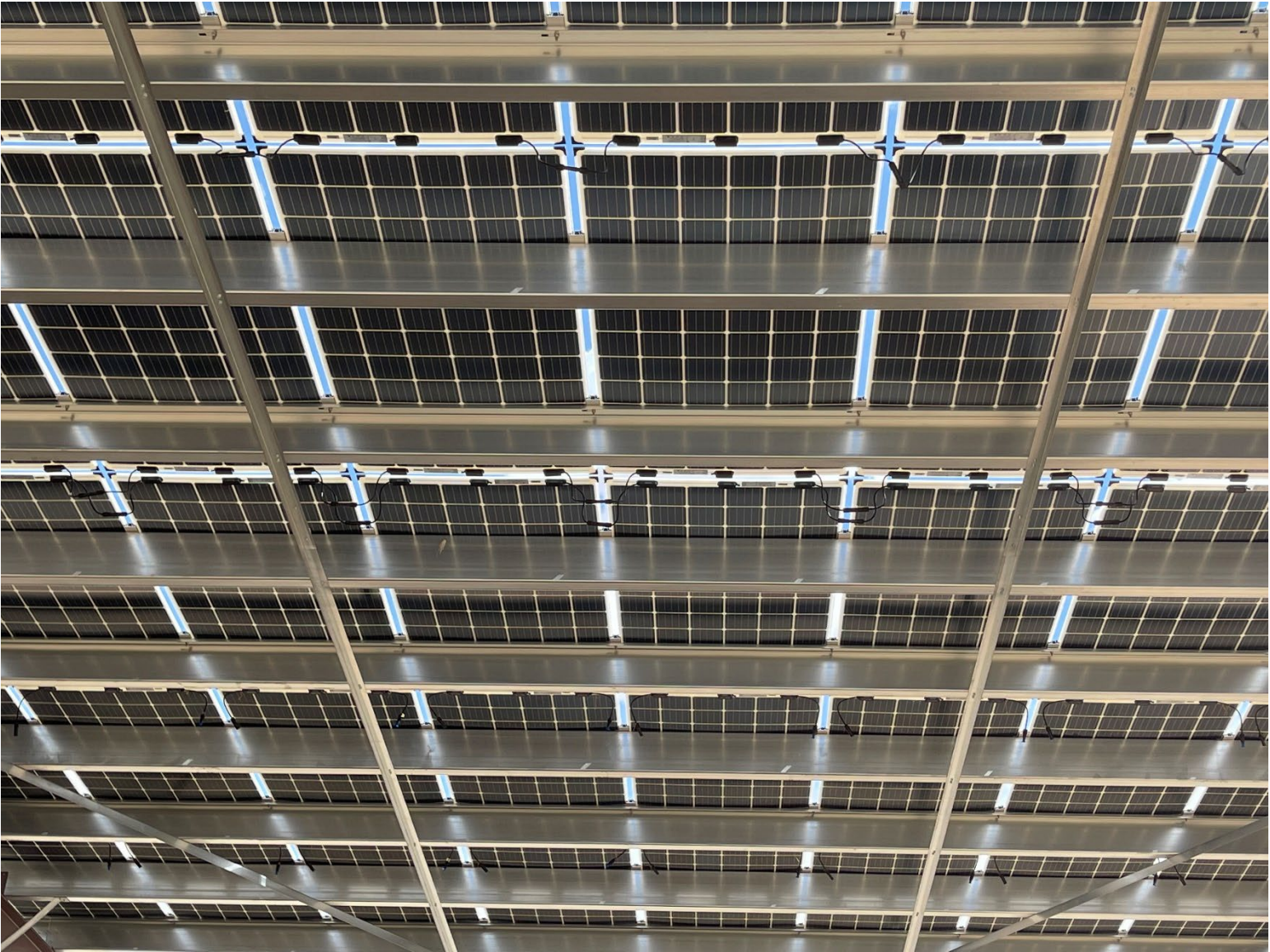
# San Xavier Solar Project – District Building



# San Xavier Solar Project – District Building



# San Xavier Solar Project – District Building



# San Xavier Solar Project – District Building



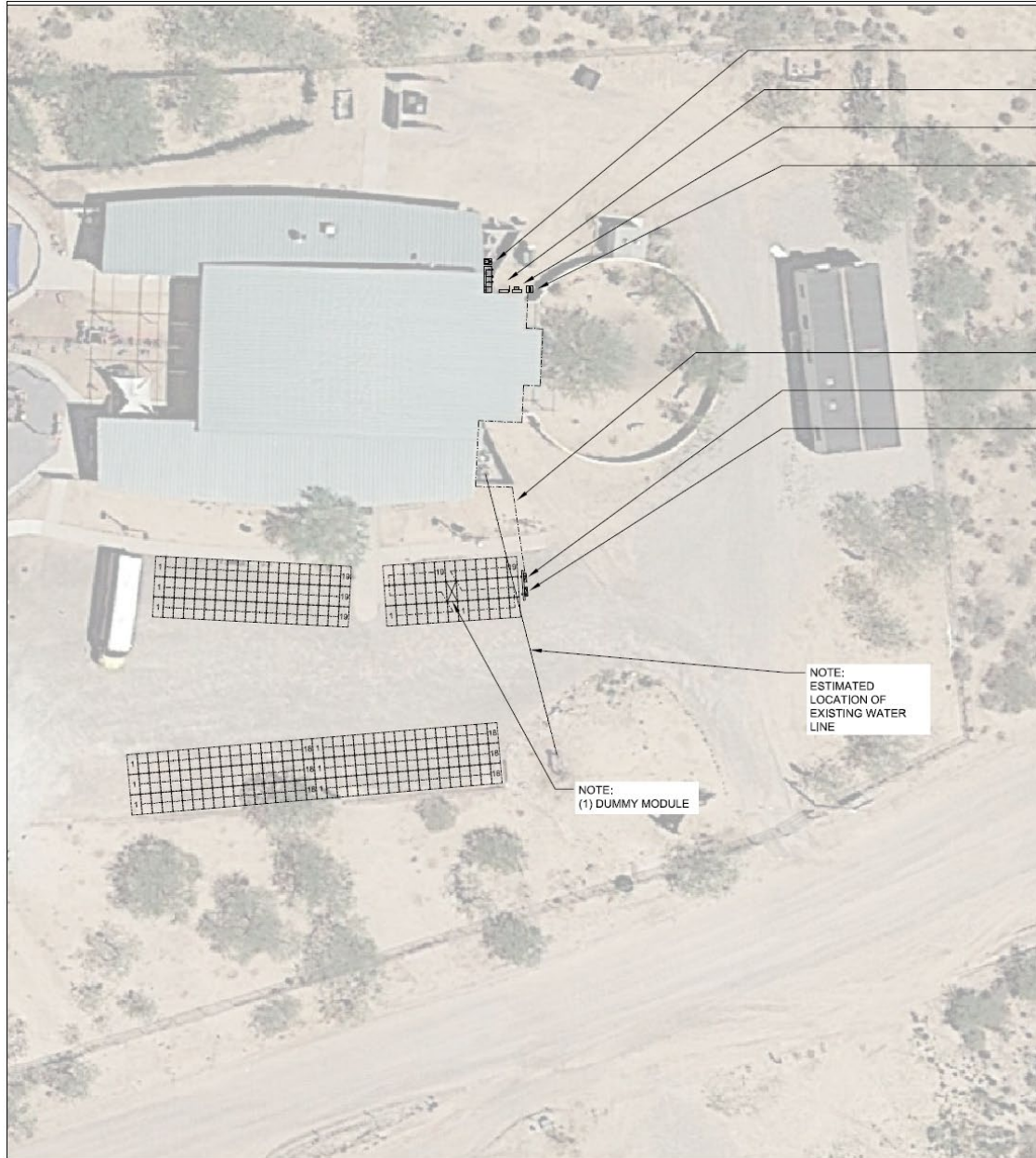
# San Xavier Solar Project – District Building



# 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)  
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  
ARC: TORONDO O'DONNAN 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  
AEOC #: 336818 GR-11

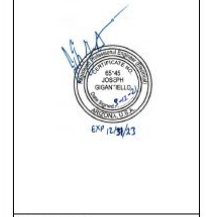
**RDS**

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



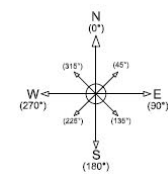
**ISSUE PURPOSE:**

DESIGN DEVELOPMENT  
 CONSTRUCTION  
 REVISION  
 RECORD

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

<b>REVISED:</b>	
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"

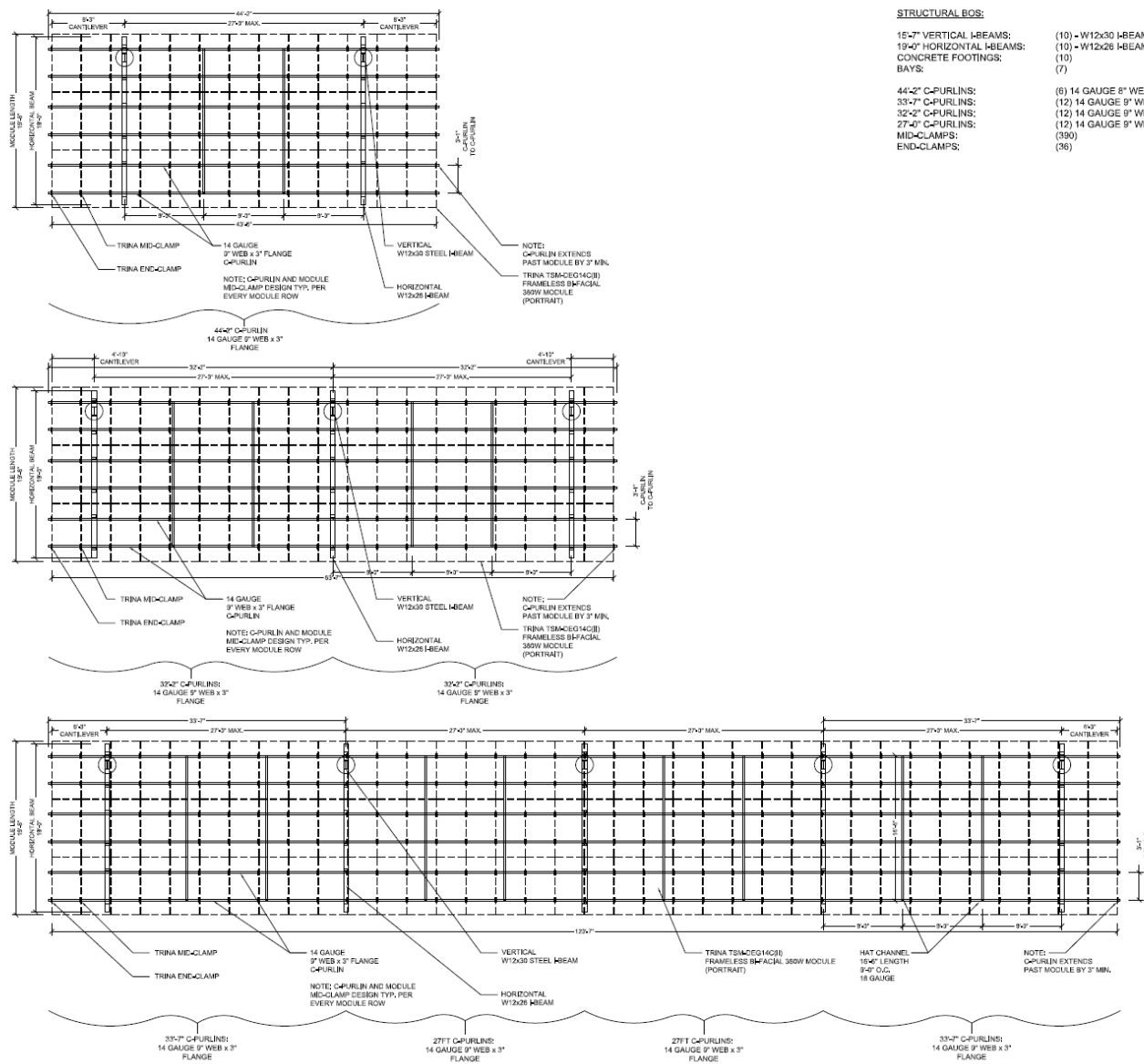






# San Xavier Solar Project – Education Building

**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)

**PHOTOVOLTAGE 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  
10345 ESTATE LANE, SUITE 6-105  
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 # 101315462701  
AZNOC # 324818 CR-11



SOLAR PV CONSULTANT:  
RENEWABLE DESIGN SOLUTIONS  
15945 ESTATE LANE, SUITE 6-105  
DALLAS, TX 75238  
PHONE: 214.564.9535  
WWW.RENEWABLEDESIGNSOLUTIONS.COM

**CIVIL ENGINEER:**

CABIAN ENGINEERING, INC  
16322 OLD WASHINGTON ROAD  
NEVADA CITY, CA 95959  
PHONE: 530.478.9600  
EMAIL: CABIANENG@GMAIL.COM



ISSUE PURPOSE:  
 DESIGN DEVELOPMENT  
 CONSTRUCTION  
 REVISION  
 RECORD

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

REVISION:	DATE:	BY:	APP'D:
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

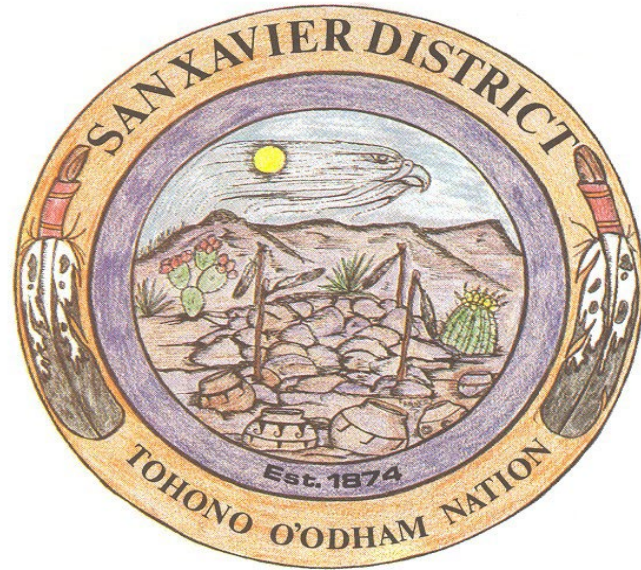


# San Xavier Solar Project – Education Building

## Our Security Guard



# Thank You!



Sandi Alvarez  
John Baskett  
Richard Grijalva  
520-573-4000

## QUESTIONS?