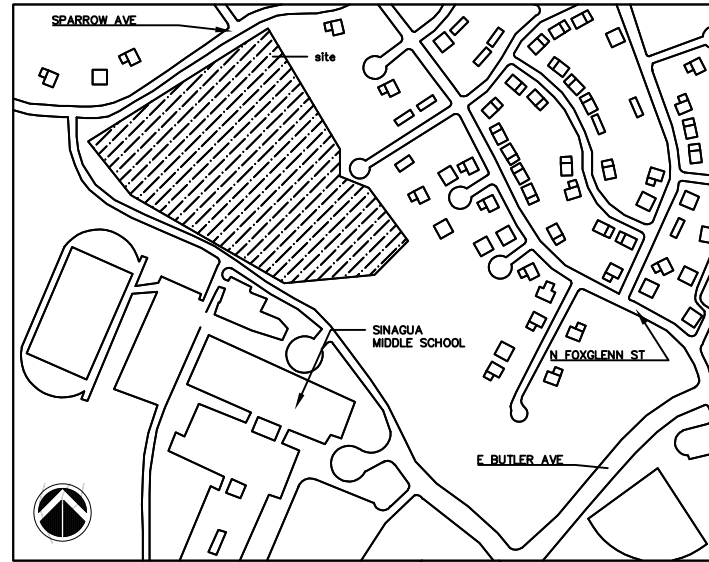


LOCATION MAP (NTS)

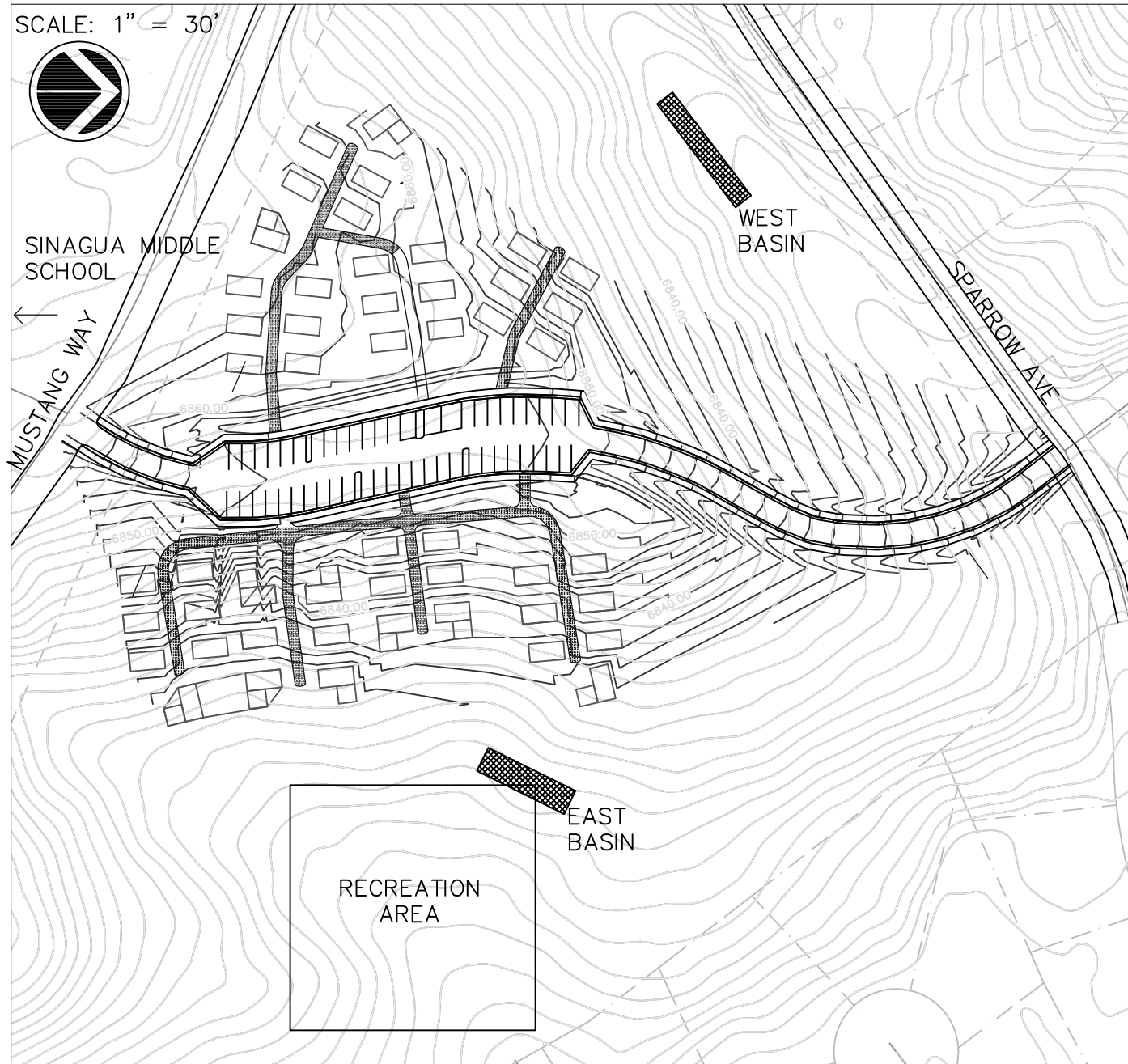


VICINITY MAP (NTS)

# HOMES FOR TEACHERS – HABITAT FOR HUMANITY FUSD PRELIMINARY SITE DESIGN

## PRELIMINARY SITE PLAN

LOCATED IN THE SW<sup>1</sup>/<sub>4</sub> SECTION 13, T 21 N, R 7 E, G. & S.R.M, FLAGSTAFF, COCONINO COUNTY, ARIZONA



### PROJECT INFORMATION:

PROJECT NAME: TINY HOME AFFORDABLE HOUSING  
 PROJECT LOCATION: 701 N. KENDRICK STREET  
 FLAGSTAFF, ARIZONA 86001  
 LATITUDE: 35°11'54.4"N  
 LONGITUDE: 111°36'11.6"W  
 APN NUMBER: 106-08-002V  
 TOTAL ACREAGE: 18.88  
 DEVELOPED ACREAGE: 9.4  
 CURRENT USE: VACANT  
 PROPOSED USE: TINY HOME AFFORDABLE HOUSING  
 TOTAL NUMBER OF UNITS: 50  
 TOTAL NUMBER OF PARKING STALLS: 51  
 NUMBER OF ADA ACCESSIBLE UNITS: 6  
 NUMBER OF ADA ACCESSIBLE PARKING STALLS: 3

### TABLE OF CONTENTS

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| DRAINAGE SHEET            | 4 |
| ROADS, CURBS, AND GUTTERS | 5 |
| UTILITY LAYOUT SHEET      | 6 |

### TEAM INFORMATION

**SENIOR ENGINEER:**  
 ANNA KURN  
 ALK299@NAU.EDU

**ENG IN PRACTICE:**  
 DAVID BORJA  
 DMB468@NAU.EDU

**ENG IN TRAINING:**  
 MICHAEL BULRISS  
 MDB355@NAU.EDU

**INTERN:**  
 ABDULRAHIM ABDULLAH  
 AMA778@NAU.EDU

**CLIENT:**  
 STEVE MEAD  
 STEPHEN.MEAD@NAU.EDU

**TECHNICAL ADVISOR:**  
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 SIRWIN@SWIAZ.COM

**PRELIMINARY**  
 NOT FOR CONSTRUCTION  
 OR RECORDING

Job Name: PRELIM DESIGN

Job NO: 19  
 Date: 3.31.19  
 Scale: VARIES  
 Drawn: KURN  
 Design: BORJA  
 Checked: BULRISS

ABK

| Revisions | No. | Description | Date | By |
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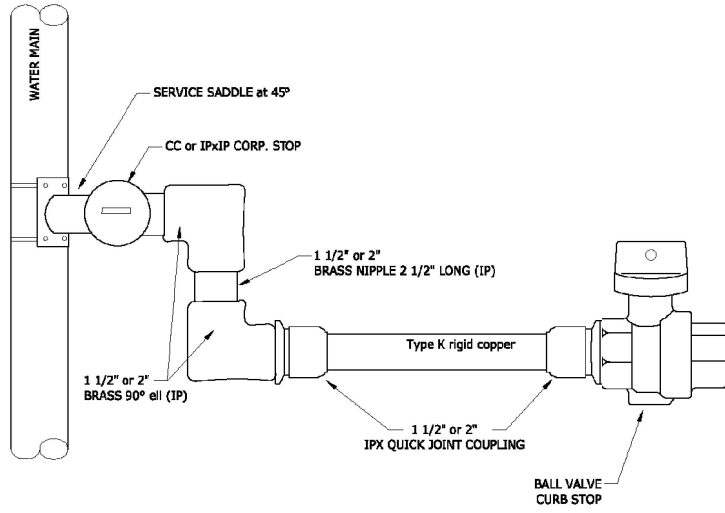
Drawing No. CVR

Sheet No. 1 of 6

COVER

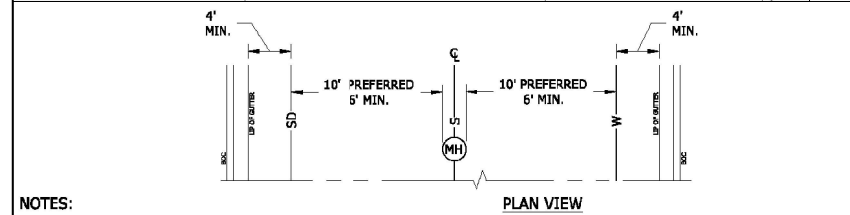
# HOMES FOR TEACHERS – HABITAT FOR HUMANITY FUSD PRELIMINARY SITE DESIGN

## TYPICAL NOTES AND DETAILS

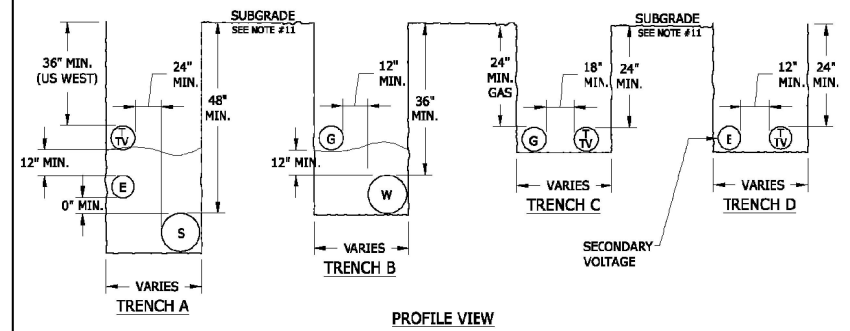


- NOTE:**
- ALL FITTINGS USED IN CONNECTIONS WITH 1 1/2" AND 2" TYPE K RIGID COPPER SHALL BE NEW MUELLER OR FORD QUICK JOINT COUPLINGS PER SECTION 9-3-070.1
  - ALL 1 1/2" AND 2" SHALL ENTAIL A SWING TYPE CONNECTION CONSISTING OF TWO 90 DEGREE ELLS AND ONE 1 1/2" x 2 1/2" OR 2" x 2 1/2" BRASS NIPPLE BETWEEN THE 90 DEGREE ELLS.
  - ALL 1 1/2" AND 2" METER VALVE CONNECTIONS SHALL BE IPXIP BALL VALVE TYPE THAT ARE EQUAL OR EXCEED THOSE MANUFACTURED, B11-666; OR JONES J-1900.
  - THE CURB STOP SHALL BE INSTALLED 19-20" BELOW FINISHED GRADE.

City of Flagstaff  
**ENGINEERING DETAIL**  
**WATER SERVICE CONNECTION**  
**1 1/2" AND 2"**  
 DETAIL NO. **09-03-071** REVISION DATE: 11/22/16 **1**

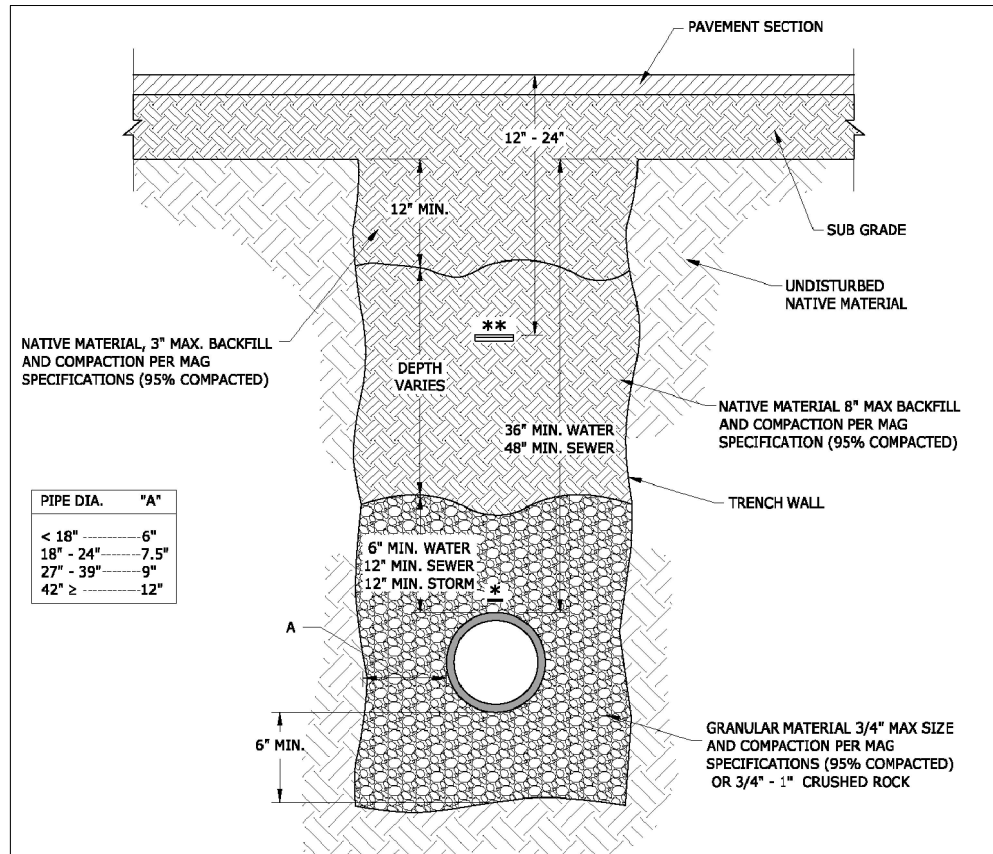


- NOTES:**
- WHERE POSSIBLE SEWER SHOULD BE LOCATED AT THE CENTERLINE.
  - WATER SHOULD BE 10" NORTH OR EAST OF CENTERLINE (MIN. 6" SEPARATION FROM SEWER.)
  - STORMDRAIN SHOULD BE 10" FROM SEWER (MIN. 6") ON THE OPPOSITE SIDE OF WHERE WATER IS LOCATED.
  - NO UTILITY SHALL BE LESS THAN 4" FROM LIP OF GUTTER.



- NOTES:**
- THE DIMENSIONS GIVEN IN THESE TRENCH DETAILS ARE MINIMUM. DEPENDING ON THE NUMBER AND SIZE OF UTILITIES IN A TRENCH, ADDITIONAL COVER AND/OR CLEARANCES MAY BE REQUIRED.
  - MINIMUM COVER SHALL BE MEASURED FROM THE TOP OF THE PIPE TO THE SUBGRADE UNDER EXISTING OR PROPOSED PAVEMENT. IN AREAS THAT ARE NOT TO BE PAVED, MINIMUM COVER SHALL BE MEASURED FROM FINISHED GRADE.
  - MINIMUM HORIZONTAL DISTANCE BETWEEN WATER AND SEWER PIPS IS 6 FEET.
  - WHEN SEWER AND WATER LINES CROSS, REFER TO ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY (A.D.E.Q.) GUIDELINES, AND OTHER CITY STANDARDS.
  - WHILE POWER AND COMMUNICATION CABLES MAY BE INSTALLED IN SANITARY SEWER TRENCHES, A SEPARATE TRENCH MAY BE REQUIRED WHEN DEEPEST NECESSARY BY UTILITY COMPANIES.
  - WATER AND ELECTRIC POWER LINES ARE NOT ALLOWED IN THE SAME TRENCH.
  - GAS AND SEWER LINES ARE NOT ALLOWED IN THE SAME TRENCH.
  - TWO WORKING DAYS BEFORE YOU DIG, CALL FOR THE BLUE STAKES 1-800-STAKE-IT
  - TRACER WIRES SHALL BE INSTALLED IN ACCORDANCE WITH STANDARD 9-01-020.
  - WHEN POWER AND COMMUNICATION CABLES ARE NOT IN THE SAME TRENCH, THEY SHALL HAVE A MINIMUM HORIZONTAL SEPARATION OF 36" FROM WATER LINES AND 24" FROM SEWER LINES, AND SHALL MAINTAIN A MINIMUM OF 24" ABOVE SEWER LINES. WHEN GAS LINES ARE NOT IN THE SAME TRENCH, A MINIMUM HORIZONTAL SEPARATION OF 36" FROM SEWER LINES AND 18" FROM WATER LINES SHALL BE MAINTAINED; GAS LINES SHALL ALSO BE A MINIMUM OF 18" ABOVE WATER LINES. ALL MEASUREMENTS SHALL BE MADE FROM THE OUTSIDE EDGE OF PIPE OR CABLE.
  - MINIMUM DEPTHS FOR POWER, GAS, TELEVISION, AND COMMUNICATION ARE MEASURED FROM FINISHED GRADE.
  - ALL WATERLINE (FIRE HYDRANT LEAD LINES, FIRE LINES AND SERVICE LINES SHALL HAVE A MINIMUM HORIZONTAL SEPARATION OF 3')

City of Flagstaff  
**ENGINEERING DETAIL**  
**UNDERGROUND UTILITIES IN STREETS**  
**TYPICAL LOCATION AND TRENCH DETAIL**  
 DETAIL NO. **9-01-010** REVISION DATE: 11/22/16 **1**

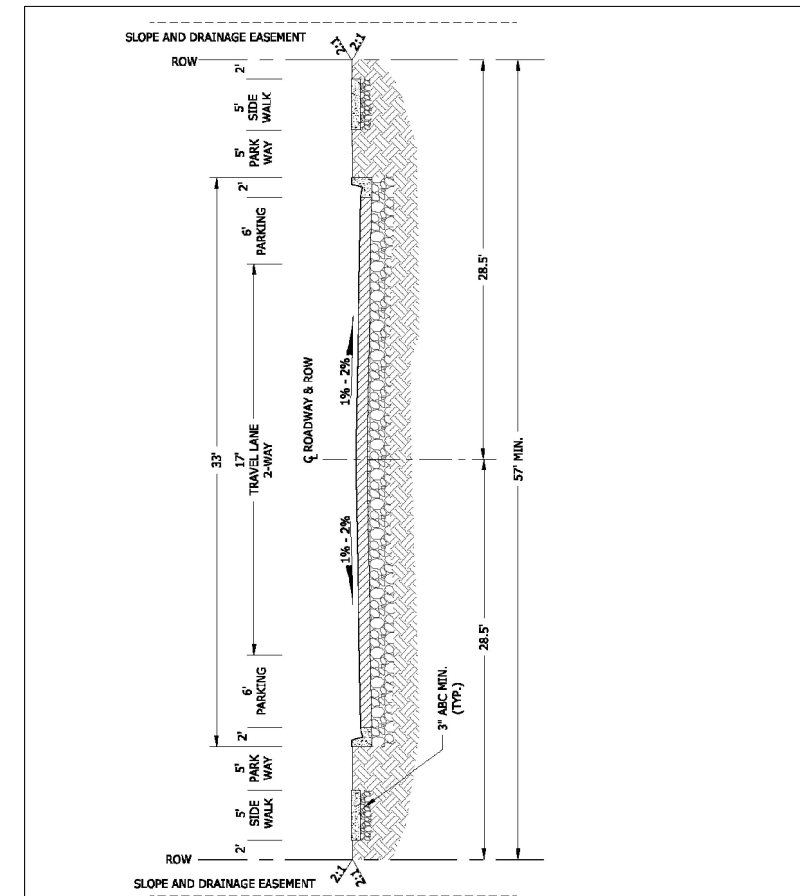


| PIPE DIA. | "A"  |
|-----------|------|
| < 18"     | 6"   |
| 18" - 24" | 7.5" |
| 27" - 39" | 9"   |
| 42" >     | 12"  |

- NOTES:**
- NATIVE BACKFILL SHALL BE PER MAG SPECS AND MAY BE SELECTED FROM THE EXCAVATION MATERIAL OR FROM A SOURCE SELECTED BY THE CONTRACTOR AND APPROVED BY THE CITY ENGINEER.
  - NON-SHRINK BACKFILL IN ACCORDANCE WITH COF STD. 9-6-030 AND MAY BE USED FOR BACKFILL UP TO EXISTING SUBGRADE. THE NON-SHRINK BACKFILL SHALL BE PROPORTIONED AS FOLLOWS: 2600 LBS OF 3/8" MINUS AGGREGATE, 800 LBS SAND, 94 LBS CEMENT AND 11 GALLONS WATER

City of Flagstaff  
**ENGINEERING DETAIL**  
**TRENCHING AND BACKFILL**  
**NEW PAVED STREET**  
 DETAIL NO. **9-01-031** REVISION DATE: 11/22/16 **1**

- NOTES:**
- REFERENCE COF ENGINEERING DESIGN STANDARDS AND MARICOPA ASSOCIATED GOVERNMENT DETAILS WHERE NECESSARY.
  - COF DIVISION 10-50.90 FOR RESOURCE PROTECTION STANDARDS WAS MET BY ALLOCATION 80% OF TOTAL LOT FOR UNDEVELOPED OPEN AREAS WITH BY USE OF TREE BANKS.
  - COF BUILDING CODES 10-50.110.080 FOR BUNGALOW COURT BUILDING TYPES WAS USED AS BASIS FOR DESIGN.
  - AFFORDABLE HOUSING INCENTIVES WERE USED FOR THIS PROPOSED DEVELOPMENT IN REDUCTION OF THE PARKING LANDSCAPING ISLANDS AND BUILDING SETBACKS WITHIN THE PROPERTY.



City of Flagstaff  
**ENGINEERING DETAIL**  
**RESIDENTIAL LOCAL**  
 DETAIL NO. **10-09-038** REVISION DATE: 11/22/16 **1**

Job Name: PRELIM DESIGN  
 NOTES & DETAILS

Job NO: 19  
 Date: MAR - 31-19  
 Scale: N/A  
 Drawn: KURN  
 Design: BULRISS  
 Checked: ABDULLAH

ABK

| NO. | Description | Date | By |
|-----|-------------|------|----|
|     |             |      |    |
|     |             |      |    |
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Drawing NO. **NOTES**  
 Sheet NO. **2** Of **6**

**IMPERVIOUS SURFACES:**  
 AB PAVEMENT: 40,400 sq ft.  
 BUILDING PADS: 20,900 sq ft.  
 SIDEWALKS: 5,900 sq ft.  
 DECOMPOSED GRANITE WALKWAYS (8' WIDE): 9,915 sq ft.  
 TOTAL: 77,115 sq ft.

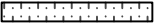



# HOMES FOR TEACHERS – HABITAT FOR HUMANITY FUSD PRELIMINARY SITE DESIGN

## GRADING PLAN SHEET

LOCATED IN THE SW¼ SECTION 13, T 21 N, R 7 E, G. & S.R.M,  
 FLAGSTAFF, COCONINO COUNTY, ARIZONA

**EARTHWORK VOLUMES:**  
 TOTAL CUT: 4,562 CU. YDS  
 TOTAL FILL: 6,073 CU. YDS.

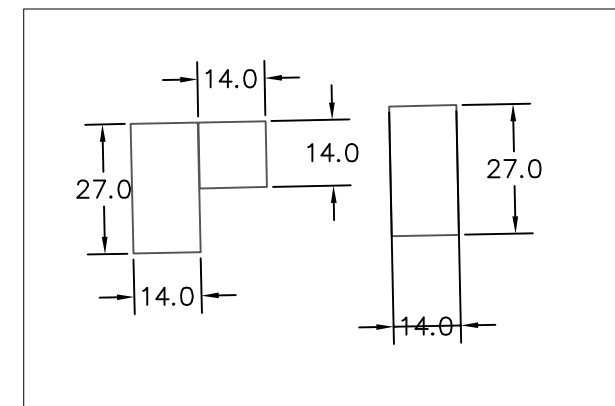
**LEGEND**

- DECOMPOSED GRANITE WALKS 
- ADA ACCESSIBLE 
- PROPOSED CONTOUR LINES 
- EXISTING CONTOUR LINES 

**ADDITIONAL RESTRICTIONS**

Adequate drainage, erosion and sediment control measures, best management practices, and/or other stormwater management facilities shall be provided and maintained at all times during construction. Damages to adjacent property and/or the construction site caused by the contractor's or property owner's failure to provide and maintain adequate drainage and erosion/sediment control for the construction area shall be the responsibility of the contractor and/or property owner.

**TYPICAL TINY HOME LAYOUTS**  
 SINGLE STUDIO: 380 SQ FT  
 1 BEDROOM: 576 SQ FT



**PRELIMINARY**  
 NOT FOR CONSTRUCTION  
 OR RECORDING

SCALE: 1" = 30'



SINAGUA MIDDLE SCHOOL



Job Name: PRELIM DESIGN

Job NO:19  
 Date:02.19  
 Scale: 1:30  
 Drawn:KURN  
 Design:BORJA  
 Checked:A.ABDUL

ABK

| Revisions | No. | Description | Date | By |
|-----------|-----|-------------|------|----|
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|           |     |             |      |    |

Drawing No. GRADING  
 Sheet No. 3 of 6

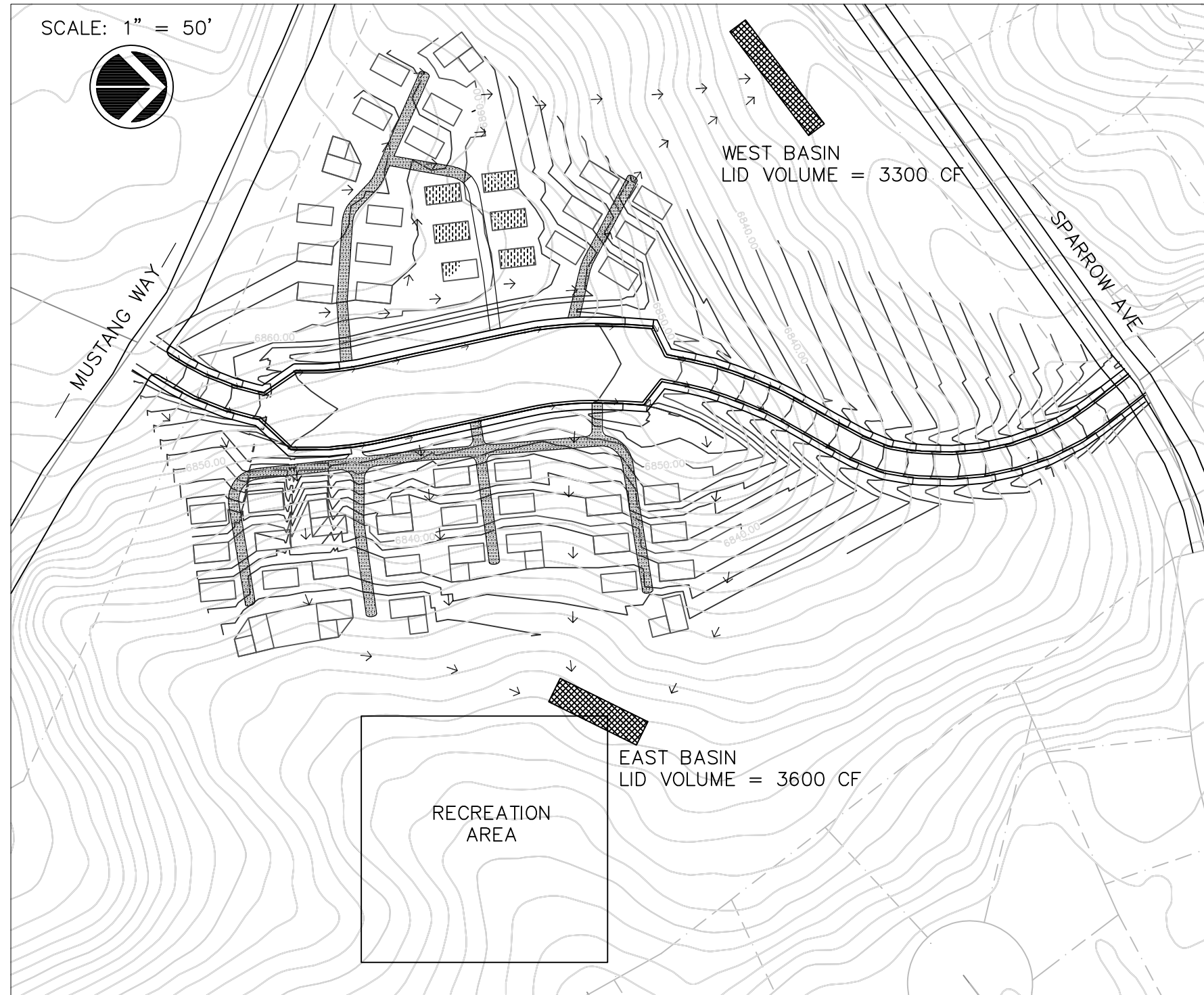
# HOMES FOR TEACHERS – HABITAT FOR HUMANITY FUSD PRELIMINARY SITE DESIGN

## DRAINAGE PLAN SHEET

LOCATED IN THE SW $\frac{1}{4}$  SECTION 13, T 21 N, R 7 E, G. & S.R.M,  
FLAGSTAFF, COCONINO COUNTY, ARIZONA

### LEGEND

- RIP RAP CHANNELS
- LID EXTENDED DETENTION BASIN
- PROPOSED CONTOUR LINES
- EXISTING CONTOUR LINES



### WEST DETENTION BASIN PROPERTIES

PONDING DEPTH = 3 FT  
 AREA = 1500 SQ FT  
 LENGTH = 100 FT  
 TOP WIDTH = 15 FT  
 BOTTOM WIDTH = 7 FT  
 EMBANKMENT WIDTH = 4 FT  
 SLOPE = 0.75  
 DETENTION VOLUME = 3300 CUB. FT

### EAST DETENTION BASIN PROPERTIES

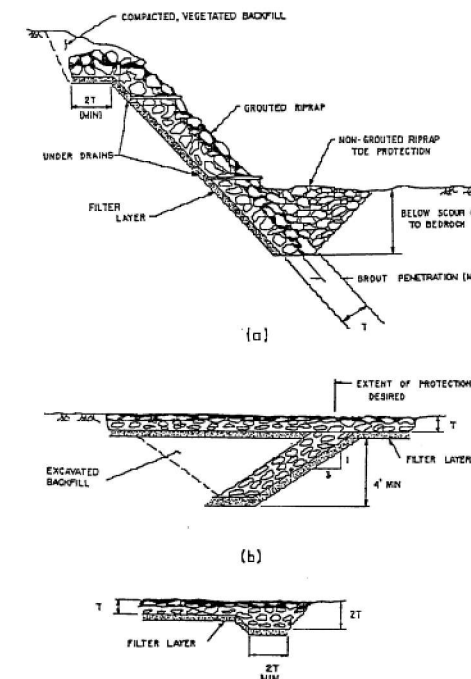
PONDING DEPTH = 3 FT  
 AREA = 1500 SQ FT  
 LENGTH = 75 FT  
 TOP WIDTH = 20 FT  
 BOTTOM WIDTH = 12 FT  
 EMBANKMENT WIDTH = 4 FT  
 SLOPE = 0.75  
 DETENTION VOLUME = 3600 CUB. FT

### LID REQUIREMENTS:

LID ROCV REQUIRED = 6,426 CF  
 LID PROVIDED = 6,900' AT DEPTH OF 1.0"  
 100 YEAR OUTFLOW = 23.56 CFS

### IMPERVIOUS AREA AND LID ANALYSIS BY BASIN

| BASIN ID   | TOTAL BASIN AREA(SF) | TOTAL IMPERVIOUS AREA (SF) | REQ 1" LID VOLUME BASED ON IMPERV. AREA (CF) | CALCULATED REQ DETENTION VOLUME (CF) | PROVIDED LID VOLUME (CF) |
|------------|----------------------|----------------------------|--|--------------------------------------|--------------------------|
| WEST BASIN | 240388               | 39,406                     | 3,026  | 1,689                                | 3,300                    |
| EAST BASIN | 192315               | 37,709                     | 3,213  | 1,621                                | 3,600                    |



### NOTES:

- EXISTING IMPERVIOUS AREA ON PROPERTY IS 0 SQ. FT.
- GROUTED RIP RAP WILL BE UTILIZED IN AREAS WHERE SLOPE IS STEEP AND VELOCITIES APPROACH 18 FPS
- COF STORMWATER MANAGEMENT DESIGN MANUAL DETAIL 4-5 FOR GROUTED RIP RAP PROVIDED FOR USE ON CHANNELS TO BASINS
- RATIONAL METHOD WAS USED FOR HYDROLOGY ANALYSIS

**PRELIMINARY**  
 NOT FOR CONSTRUCTION  
 OR RECORDING

Job Name: PRELIM DESIGN

Job NO:19  
 Date:4.02.19

Scale: 1:30

Drawn:KURJA

Design:BORJA

Checked:A.ABDUL

ABK

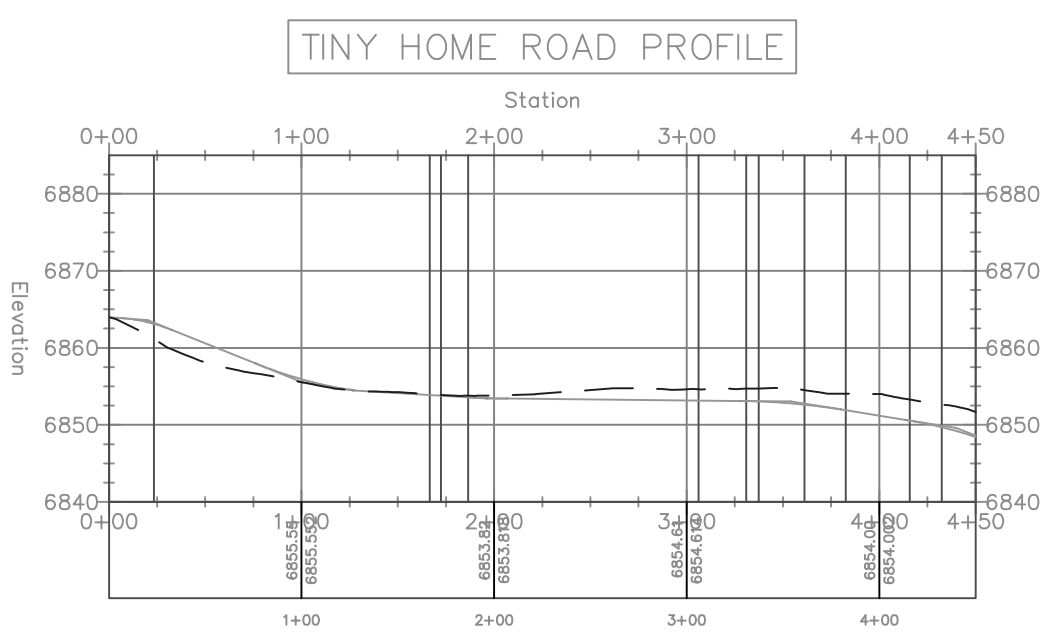
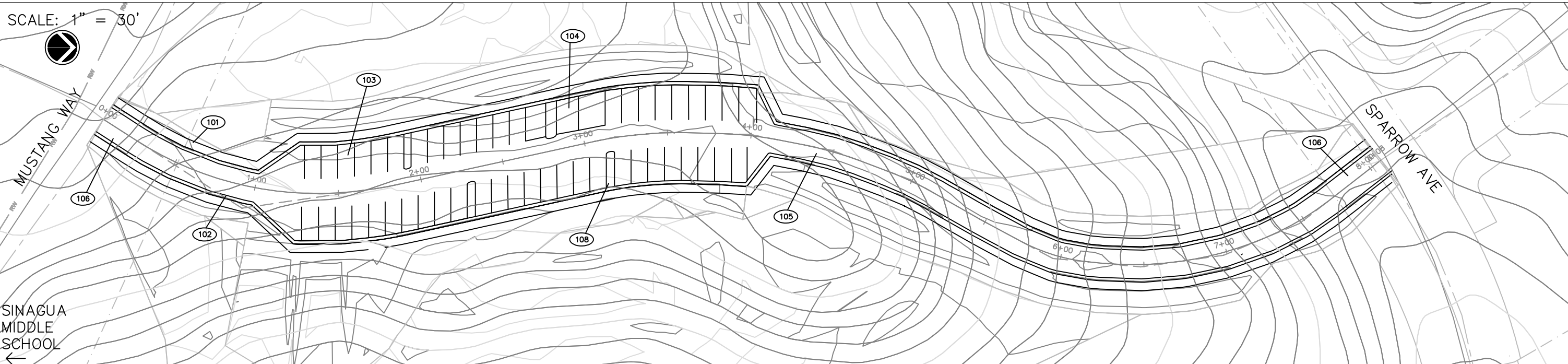
Revisions  
 NO. Description Date By

Drawing No. DRAINAGE  
 Sheet No. 4 of 6

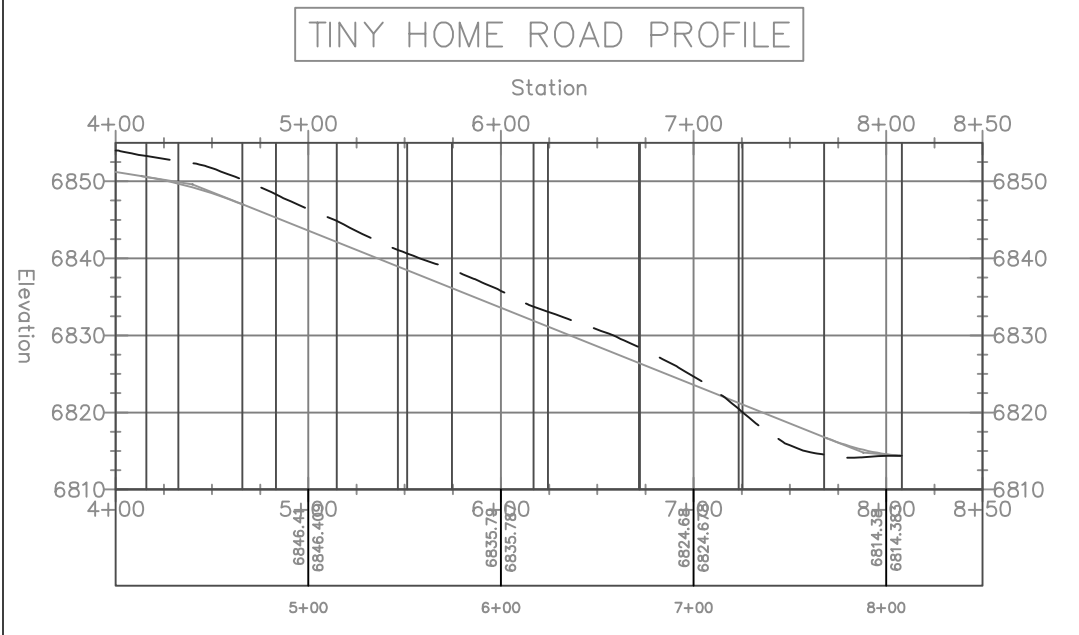
# HOMES FOR TEACHERS – HABITAT FOR HUMANITY FUSD PRELIMINARY SITE DESIGN

## ROAD, CURB, AND GUTTER PLAN SHEET

- 101 5' WIDE SIDEWALK PER COF 10-09-036
- 102 2' CURB AND GUTTER PER COF 10-09-036
- 103 STANDARD PARKING SPACE 10' WIDTH X 20' LENGTH PER COF 10-50.80.080
- 104 ADA PARKING SPACE 12' WIDTH X 20' LENGTH PER COF 10-50.80.080
- 105 8.5' WIDE TRAVEL LANE PER COF 10-09-036
- 106 2% SLOPE FOR 20' BEFORE STOP SIGN PER COF CODE 10-09-037
- 107 MAX. ROAD WIDTH DESIGNED AS 57' WITH PARKING LANES PER COF CODE 10-50.80.080
- 108 LANDSCAPING ISLANDS PER COF CODE 10-06-002



VERTICAL SCALE: 1" = 10'



VERTICAL SCALE: 1" = 10'

**ROAD DESIGN SPECIFICATIONS:**  
 DESIGN SPEED: 15 MPH  
 CREST VAL: 7  
 SAG VAL: 17  
 MIN. CURVE RADIUS: 100'  
 MAX GRADE: 10%

- NOTES:**
- REF COF DETAIL 10-09-038 FOR RESIDENTIAL LOCAL ROAD REQS FOLLOWED.
  - REF COF 13-10-008-002 FOR SPEED, CREST, AND SAG REQS.
  - REF COF 13-10-011-0001 FOR RADUIS AND GRADE REQS.

**STREETS:**  
 THE STREETS SHOWN WITHIN THE TINY HOME AFFORDABLE HOUSING FUSD PROPERTY SHALL BE PRIVATE AND NO ON STREET PARKING IS PROPOSED.

|                         |
|-------------------------|
| Job Name: PRELIM DESIGN |
| Job NO:19               |
| Date: 4.12.19           |
| Scale: VARIES           |
| Drawn: KURN             |
| Design: BORJA           |
| Checked: BULRISS        |
| ABK                     |
| Drawing No. ROADS       |
| Sheet No. 5 of 6        |

PRELIMINARY

NOT FOR CONSTRUCTION  
OR RECORDING

# HOMES FOR TEACHERS – HABITAT FOR HUMANITY FUSD PRELIMINARY SITE DESIGN

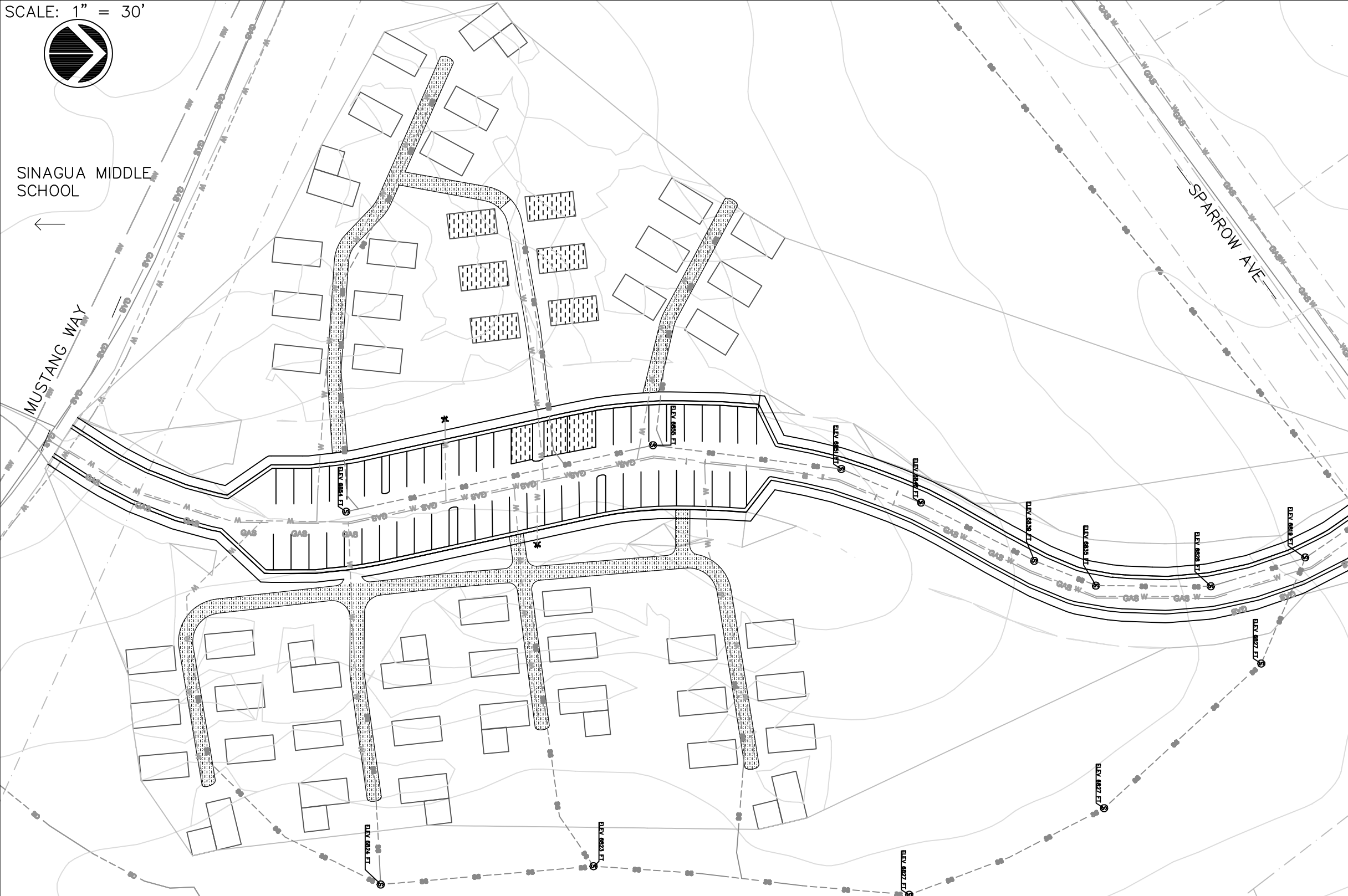
## UTILITY LAYOUT PLAN SHEET

**LEGEND**

- WATER MAIN --- W ---
- SEWER MAIN --- SS ---
- GAS MAIN --- GAS ---
- SEWER MANHOLE ⊙
- FIRE HYDRANT ⊙
- PROPOSED 5' CONTOUR LINES ---

- ABBREVIATIONS**
- HYD FIRE HYDRANT
  - W WATER
  - SS SANITARY SEWER
  - EX EXISTING
  - FU FIXTURE UNITS

SCALE: 1" = 30'



SINAGUA MIDDLE SCHOOL

- NOTES:**
1. REFERENCE COF DETAIL 09-01-010 UNDERGROUND UTILITES IN STREETS TYPICAL LOCATION AND TRENCH DETAIL
  2. WATER ACCESS WILL BE CONNECTED TO PRE - EXISTING WATER MAINS ON MUSTANG WAY AND SPARROW AVE
  3. DETAIL 09-01-010 TRENCH B DETAIL PLACES WATER AND GAS LINES IN SAME TRENCH
  4. MIN. SPACE OF 1' REQ. BETWEEN WATER AND GAS IN HORIZONTAL VERTICAL DIRECTIONS
  5. COF CODE 09-01-010 DETAILS WATER AND SEWER LINES SEPERATED 6' HOR. AND 2' VERT. TO AVOID CROSS CONTAMINATION
  6. REFERENCE COF CODE 13-09-02-003 TO MANHOLE SPACING AND DIAMETER REQ
  7. 8" PVC WATER MAIN LINE

**WATER DEMAND**  
 MULTIFAMILY # PEO PER UNIT = 2.5  
 AVERAGE DEMAND: 75 GPCD  
 PEAK DEMAND: 250 GPCD  
 MAX. TOT. DAILY USE: 34,500 GPD  
 PEAK DAILY Q = 24 GPM  
 MIN. FIRE FLOW REQ: 1,500 GPM

**SEWER REQUIREMENTS:**  
 8" PVC SDR35 SANITARY SEWER MAIN  
 AVERAGE DAILY FLOW = 75GCPD  
 MINIMUM VELOCITY = 2.5 FPS  
 MAXIMUM MANHOLE SPACING=400 FT  
 MIN MANHOLE DIAMETER = 48 IN

**PRELIMINARY**  
 NOT FOR CONSTRUCTION  
 OR RECORDING

|                         |                |
|-------------------------|----------------|
| Job Name: PRELIM DESIGN |                |
| Job NO: 19              | Date: 4.14.19  |
| Scale: 1:30             | Drawn: BULRISS |
| Design: A.ABDUL         | Checked: BORJA |
| ABK                     |                |
| Revisions               | Date           |
| NO. Description         | By             |
| UTILITY                 | 6              |
| Drawing No. 6           | of 6           |
| Sheet No. 6             | of 6           |