# HAVASU 280
# IMPROVEMENT PLANS

**LOCATED IN PORTION OF SECTIONS 24, 25, T.13 N., R.20W. OF THE GILA AND SALT RIVER MERIDIAN, LAKE HAVASU CITY, MOHAVE COUNTY, ARIZONA**

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6 - MARINA ACCESS - STA 43+75 - 52+75
7 - MARINA ACCESS - STA 52+75 - 61+75
8 - MARINA ACCESS - STA 61+75 - 70+75
9 - MARINA ACCESS - STA 70+75 - 79+75
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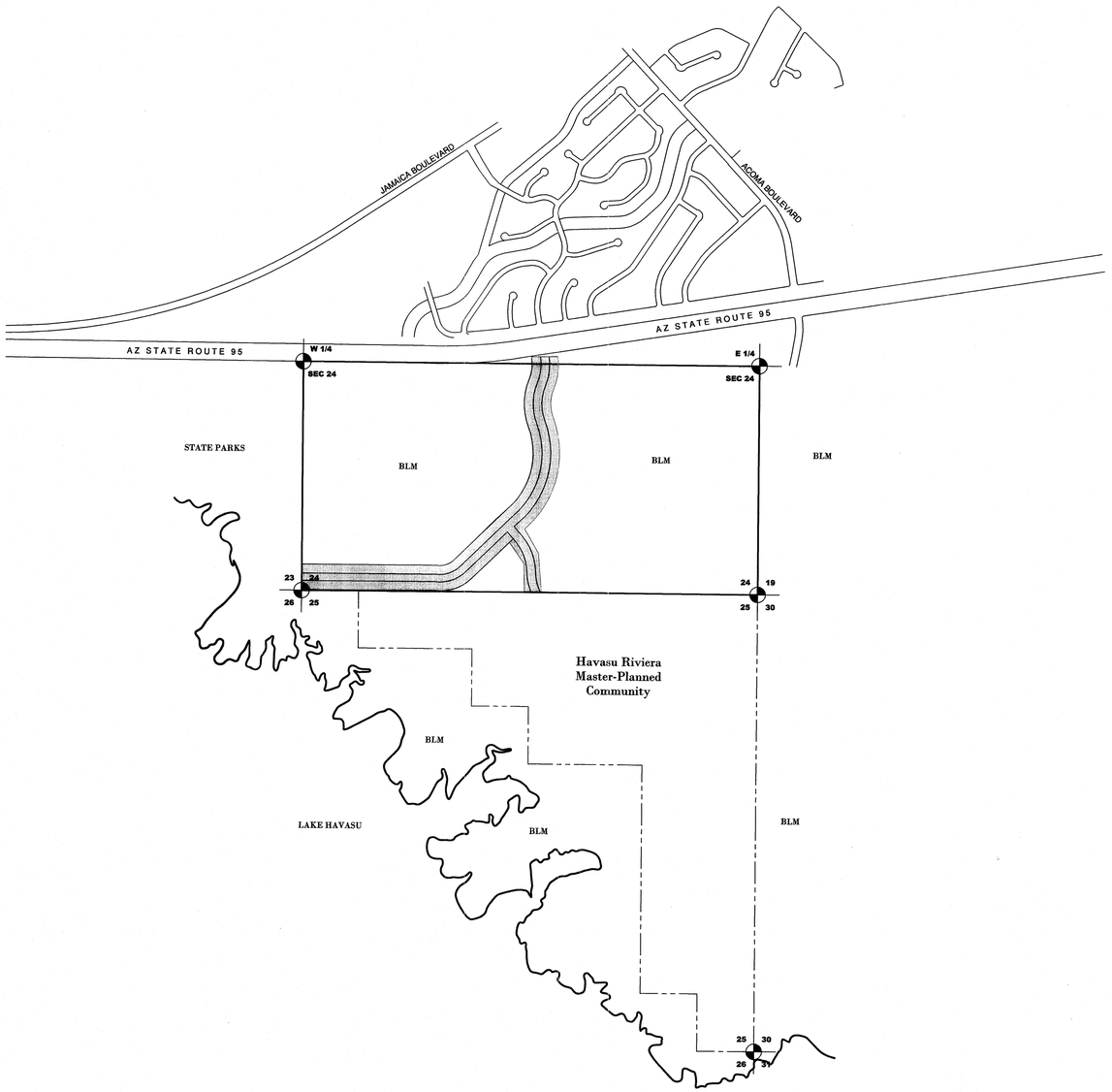
**MULTI-USE PADS**

16 - MULTI-USE PAD #1
17 - MULTI-USE PAD #2
18 - MULTI-USE PAD #3
19 - MULTI-USE PAD #4
20 - ECO-EDUCATIONAL CENTER PAD

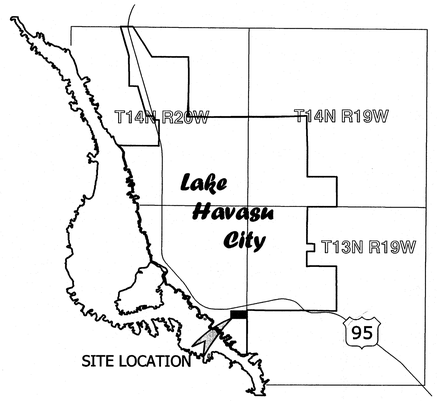

**HAVASU 280 ESTIMATED QUANTITIES**

| ITEM NO. | DESCRIPTION | EST. QTY. | UNIT |
|---|---|---|---|
| | **EARTHWORK** | | |
| 1 | Clear & Grub | 40 | ACRES |
| 2 | Total Cut (bank) | 147,680 | CY |
| 3 | Total Fill (compacted) | 124,882 | CY |
| 4 | Cut for Box Culvert Crossing | 1,406 | CY |
| | **DRAINAGE** | | |
| 1 | 36" HDPE | 403 | LF |
| 2 | # of Headwalls | 4 | EA |
| 3 | # of Trash Racks | 2 | EA |
| 4 | Outlet Riprap Protection | 53 | CY |
| 5 | Box Culvert Crossing for Pedestrians/Golf Carts | 1 | EA |




**VICINITY MAP**
**N.T.S.**

NORTH




**LOCATION MAP**
**N.T.S.**

**BASIS OF BEARING**

THE BEARING OF N 89° 39' 43" W ALONG THE SOUTH LINE OF THE SOUTH WEST QUARTER OF SECTION 24, TOWNSHIP 13 NORTH, RANGE 20 WEST OF THE G.& S.R.M., MOHAVE COUNTY, ARIZONA

**LEGEND**

- ROADWAY AREA INCLUDED IN PLAN SET
- 10+00 — 11+00 CENTERLINE STREET
- EXISTING GROUND CONTOURS
- PROPOSED GROUND CONTOURS
- RIGHT OF WAY

**SERVICE PROVIDERS:**

WATER - CITY OF LAKE HAVASU CITY
WATER DIVISION.
900 LONDON BRIDGE RD
LAKE HAVASU CITY, AZ 86404
(928) 855-2618

SEWER - CITY OF LAKE HAVASU CITY
WASTE WATER DIVISION
2330 McCULLUCH BLVD NORTH
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(928) 505-7002

TELEPHONE - FRONTIER COMMUNICATION
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SUITE 104
LAKE HAVASU CITY, AZ 86404
(928) 505-7283

CABLE- SUDDENLINK COMMUNICATIONS
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GAS - UNISOURCE ENERGY SERVICES
3198 SWEETWATER DRIVE
LAKE HAVASU CITY, AZ 86406
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PHONE: (928) 758-3333
FAX: (928) 758-8654


| DESIGN: | SCALE | JOB NO. | DATE | SHEET |
|---|---|---|---|---|
| DRAWN: | HORZ. N.T.S. | 7958-01 | 6/8/16 | 1 OF 20 |
| CHECK: | VERT. N.T.S. | | | |

REGISTERED CIVIL ENGINEER R. LARRY MORSE 14395 ARIZONA U.S.A. Expires 9/30/17

HAVASU 280

HAVASU 280
IMPROVEMENT PLANS
OVERALL GRADING PLAN

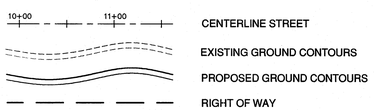
| REV. NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 1 | 6/3/16 | LHC 5/15/16 COMMENTS | SDF |

# GENERAL NOTES, ABBREVIATIONS & LEGEND

## ABBREVIATIONS

| | | |
|---|---|---|
| = | = | EQUALS |
| / | = | PER |
| @ | = | AT |
| # | = | NUMBER |
| % | = | PERCENT |
| ° | = | DEGREES |
| " | = | INCHES OR SECONDS |
| ' | = | FEET OR MINUTES |
| AAC | = | ARIZONA ADMINISTRATIVE CODE |
| AB | = | AGGREGATE BASE |
| ABAND | = | ABANDON |
| AC | = | ASPHALT CONCRETE |
| ACP | = | ASBESTOS CEMENT PIPE |
| ADEQ | = | ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY |
| ADOT | = | ARIZONA DEPARTMENT OF TRANSPORTATION |
| APPROX | = | APPROXIMATE |
| AV | = | AIR RELEASE VALVE |
| BC | = | BEGINNING OF CURVE |
| BCR | = | BEGINNING OF CURB RETURN |
| BM | = | BENCH MARK |
| BO | = | BLOW OFF |
| BVC | = | BEGIN VERTICAL CURVE |
| BVCS | = | BVC STATION |
| BVCE | = | BVC ELEVATION |
| C | = | CONCRETE OR CURB |
| CB | = | CATCH BASIN |
| CI | = | CAST IRON |
| C/L | = | CENTERLINE |
| CMP | = | CORRUGATED METAL PIPE |
| CO | = | CLEAN OUT |
| CY | = | CUBIC YARDS |
| DIP | = | DUCTILE IRON PIPE |
| E | = | EAST |
| EA | = | EACH |
| EC | = | END OF CURVE |
| ECR | = | END OF CURB RETURN |
| EG | = | EXISTING GROUND |
| EL | = | ELEVATION |
| ELEV | = | ELEVATION |
| EP | = | EDGE OF PAVEMENT |
| EOP | = | EDGE OF PAVEMENT |
| EVC | = | END VERTICAL CURVE |
| EVCS | = | EVC STATION |
| EX | = | EXISTING |
| EVCE | = | EVC ELEVATION |
| F | = | FAHRENHEIT |
| FH | = | FIRE HYDRANT |
| FHWA | = | FEDERAL HIGHWAY ADMINISTRATION |
| FL | = | FLOW LINE |
| FS | = | FINISHED SURFACE |
| G | = | GROUND |
| GV | = | GATE VALVE |
| GB | = | GRADE BREAK |
| HDPE | = | HIGH DENSITY POLYETHYLENE |
| IE | = | INVERT ELEVATION |
| INV | = | INVERT |
| LF | = | LINEAR FEET |
| LHC | = | LAKE HAVASU CITY |
| LT | = | LEFT |
| LVC | = | LENGTH OF VERTICAL CURVE |
| MAG | = | MARICOPA ASSOCIATION OF GOVERNMENTS |
| MAX | = | MAXIMUM |
| MH | = | MANHOLE |
| MIN | = | MINIMUM |
| MISC | = | MISCELLANEOUS |
| MUTCD | = | MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (FHWA) |
| N | = | NORTH |
| NTS | = | NOT TO SCALE |
| OG | = | ORIGINAL GROUND |
| P | = | PAVEMENT |
| PC | = | POINT OF CURVATURE |
| PRV | = | PRESSURE REDUCING VALVE |
| PSV | = | PRESSURE SUSTAINING VALVE |
| PT | = | POINT OF TANGENCY |
| PT | = | POINT |
| PUE | = | PUBLIC UTILITY EASEMENT |
| PVI | = | POINT OF VERTICAL INTERSECTION |
| ROW | = | RIGHT-OF-WAY |
| RT | = | RIGHT |
| S | = | SOUTH |
| S | = | SLOPE OR STATION |
| S | = | SEWER |
| SD | = | STORM DRAIN |
| SDR | = | STANDARD DIMENSION RATIO |
| SF | = | SQUARE FEET |
| S/W | = | SIDEWALK |
| STA | = | STATION |
| STD | = | STANDARD |
| TBC | = | TOP BACK CURB |
| TBS | = | TOP BACK SIDEWALK |
| VC | = | VERTICAL CURVE |
| W | = | WATER |
| W | = | WEST |
| WH | = | WHARF HYDRANT |
| WV | = | WATER VALVE |

## LEGEND




CENTERLINE STREET

EXISTING GROUND CONTOURS

PROPOSED GROUND CONTOURS

RIGHT OF WAY

## GENERAL NOTES:

1) ALL WORK AND MATERIALS SHALL CONFORM TO LAKE HAVASU CITY OFFSITE IMPROVEMENT REQUIREMENTS, LAKE HAVASU CITY TECHNICAL SPECIFICATIONS, AND MAG STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION IN ACCORDANCE WITH THE PROJECT PLANS AND SPECIFICATIONS.
2) STANDARD DETAILS REFER TO MAG STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC WORKS CONSTRUCTION AND LAKE HAVASU CITY SUPPLEMENTS TO MAG SPECIFICATIONS & DETAILS UNLESS OTHERWISE NOTED.
3) IN CASE OF CONFLICTS IN THE REQUIREMENTS BETWEEN MAG AND LAKE HAVASU CITY SPECIFICATION & DETAILS, SUCH CONFLICT SHALL BE RECONCILED BY THE ENGINEER. HOWEVER, IN GENERAL, THE FOLLOWING ORDER OF PRECEDENCE SHALL APPLY:
   A) PERMIT OR REQUIREMENTS OF GOVERNMENTAL ENTITIES & OR AGENCIES
   B) LHC OFFSITE IMPROVEMENT REQUIREMENTS
   C) LHC TECHNICAL SPECIFICATIONS
   D) MAG STANDARD DETAILS AND SPECIFICATIONS
   E) PLANS
4) THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS INCLUDING BUT NOT LIMITED TO LAKE HAVASU CITY, STATE, AND/OR COUNTY.
5) ALL APPLICABLE LOCAL, STATE AND NATIONAL SAFETY CODES AND REQUIREMENTS SHALL BE OBSERVED BY THE CONTRACTOR AT ALL TIMES DURING CONSTRUCTION.
6) THE CONTRACTOR SHALL LEGALLY DISPOSE OF ALL WASTE MATERIAL AS APPROVED BY THE OWNER.
7) ALL EXISTING UTILITY LINES SHOWN ON THE PLANS ARE FROM AVAILABLE UTILITY RECORDS. THE CONTRACTOR SHALL VERIFY THE ACTUAL FIELD LOCATIONS AND SIZES BEFORE STARTING CONSTRUCTION BY CALLING BLUE STAKE AT 1-800-STAKE-IT. THE CIVIL ENGINEER IS NOT RESPONSIBLE FOR DIFFERENCES IN HORIZONTAL AND VERTICAL ALIGNMENTS FOR UTILITY MAINS AND SERVICES.
8) THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UNDERGROUND PIPELINES, UTILITIES, AND STRUCTURES IN ADVANCE OF CONSTRUCTION AND SHALL TAKE ALL PRECAUTIONS NECESSARY TO AVOID DAMAGE TO SUCH. THE ENGINEER AND/OR OWNER DO NOT GUARANTEE ANY LOCATIONS SHOWN ON THE PLANS, OR THOSE OMITTED.
9) IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN CLOSE CONTACT WITH PROPER UTILITY ENTITIES DURING CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPLACE AT ITS EXPENSE ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION WHETHER SHOWN IN THE PROPER LOCATION ON THE PLANS OR NOT. THE CONTRACTOR SHALL PERFORM ALL EXCAVATION ACTIVITIES IN ACCORDANCE WITH THE ARIZONA BLUE STAKE LAWS.
10) THE CONTRACTOR SHALL KEEP SUITABLE EQUIPMENT AT THE JOB SITE FOR MAINTAINING DUST CONTROL AND SHALL CONTROL DUST AS DIRECTED BY THE OWNER'S REPRESENTATIVE & CITY OR COUNTY INSPECTORS.
11) SHOULD THE CONTRACTOR ENCOUNTER, DURING ITS OPERATIONS, ANY ARCHEOLOGICAL OR HISTORICAL FINDINGS, CONTRACTOR SHALL IMMEDIATELY CEASE OPERATIONS IN THE LOCATION AND NOTIFY THE OWNER.
12) NO JOB WILL BE CONSIDERED COMPLETE UNTIL ALL CLEANUP IS COMPLETE INCLUDING BUT NOT LIMITED TO CURBS, PAVEMENTS AND SIDEWALKS BEING SWEPT CLEAN OF ALL DIRT AND DEBRIS.
13) ALL MATERIALS USED ON THE PROJECT SHALL BE SUBMITTED FOR REVIEW & APPROVAL TO THE ENGINEER PRIOR TO ORDERING SUCH MATERIALS.
14) ANY WORK AND MATERIAL NOT IN CONFORMANCE WITH THE PLANS AND SPECIFICATIONS IS SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.
15) THE CONTRACTOR SHALL PROVIDE THE LAKE HAVASU CITY ENGINEERING DEPARTMENT WITH A TRAFFIC CONTROL PLAN FOR EACH PORTION OF WORK AT LEAST 10 DAYS PRIOR TO WORK BEGINNING. ANY TRAFFIC CONTROL ON CITY STREETS MUST BE APPROVED BY LAKE HAVASU CITY ENGINEERING DEPARTMENT.
16) ALL EXISTING AND NEW MANHOLE FRAMES, MANHOLE COVERS, VALVE BOXES AND WATER METER BOXES SHALL BE ADJUSTED TO FINISH GRADE IS REQUIRED BY THE WATER AND SEWER CONTRACTOR IN ACCORDANCE WITH LAKE HAVASU CITY OFFSITE IMPROVEMENT REQUIREMENTS.
17) CONSTRUCTION STAKING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF STAKING AND ANY RE-STAKING.
18) NO CHANGES TO THIS SET OF PLANS AS APPROVED FOR CONSTRUCTION BY LAKE HAVASU CITY WILL BE ALLOWED UNLESS WRITTEN PERMISSION IS OBTAINED FROM THE ENGINEER OF RECORD AND PROPOSED CHANGES SUBMITTED TO LAKE HAVASU CITY ENGINEERING DEPARTMENT FOR REVIEW AND ACCEPTANCE.
19) RECORDED DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD AND THEN FORWARDED TO LAKE HAVASU CITY WITH THE CERTIFICATE OF COMPLETION. ITEMS SUBMITTED SHOULD BE ELECTRONIC FILES (PDF).
20) ALL EARTHWORK SHALL BE DONE IN ACCORDANCE WITH LAKE HAVASU CITY STANDARD SPECIFICATIONS SECTION2100 AND 2200.

## STORM DRAINS:

1) ALL CATCH BASINS SHALL MEET MAG STANDARDS. SIZES ARE AS SHOWN ON PLANS.
2) STORM DRAIN PIPE SHALL BE HDPE (N-12) FOR SIZES UP TO 36 INCHES. PIPE SIZES ARE AS SHOWN ON PLANS.

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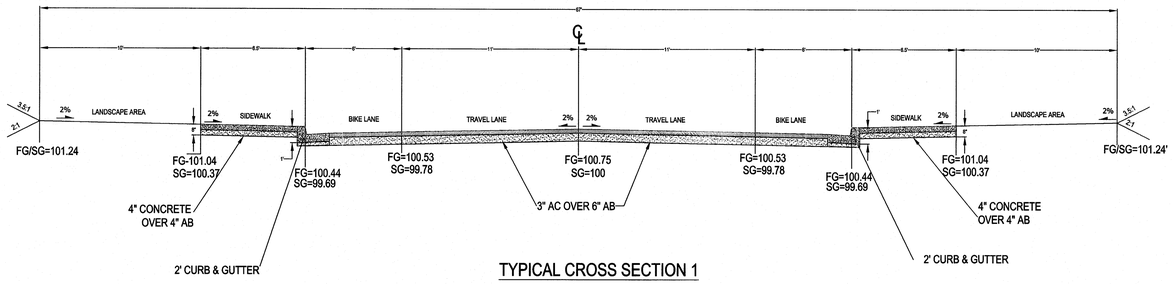
Engineering and Survey
4440 HIGHWAY 95, SUITE A
FORT MOHAVE, ARIZONA 86429
PHONE: (928) 758-3333
FAX: (928) 758-8654

| | | | | | |
|---|---|---|---|---|---|
| DESIGN: | RLM | SCALE | | JOB NO. | DATE |
| DRAWN: | SDF | HORZ. | N/A | 7958-02 | 6/6/16 |
| CHECK: | RLM | VERT. | N/A | | |

SHEET 2 OF 20

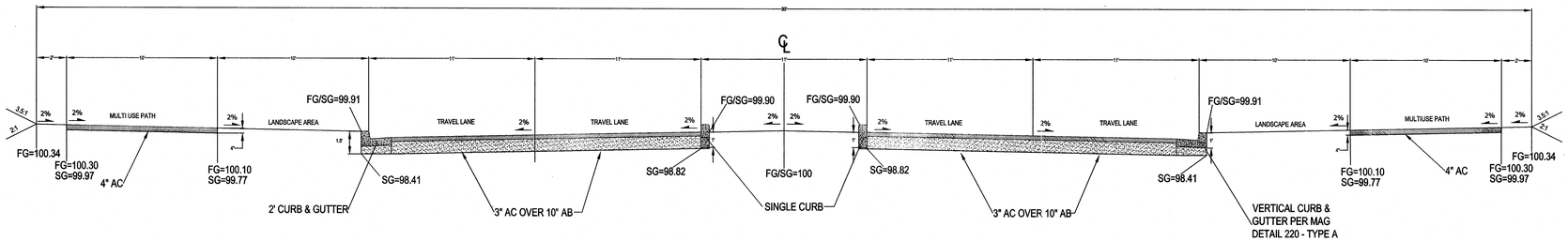
HAVASU 280
IMPROVEMENT PLANS
OVERALL GRADING PLAN

| REV. NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 1 | 6/3/16 | LHC 5/15/16 COMMENTS | SDF |



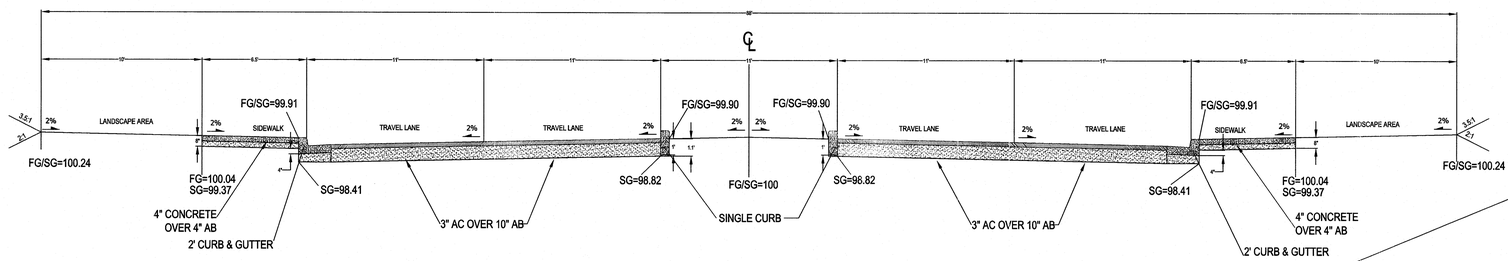

TYPICAL CROSS SECTION 1

RIVIERA ACCESS ROAD: STA 12+50 - STA 17+60



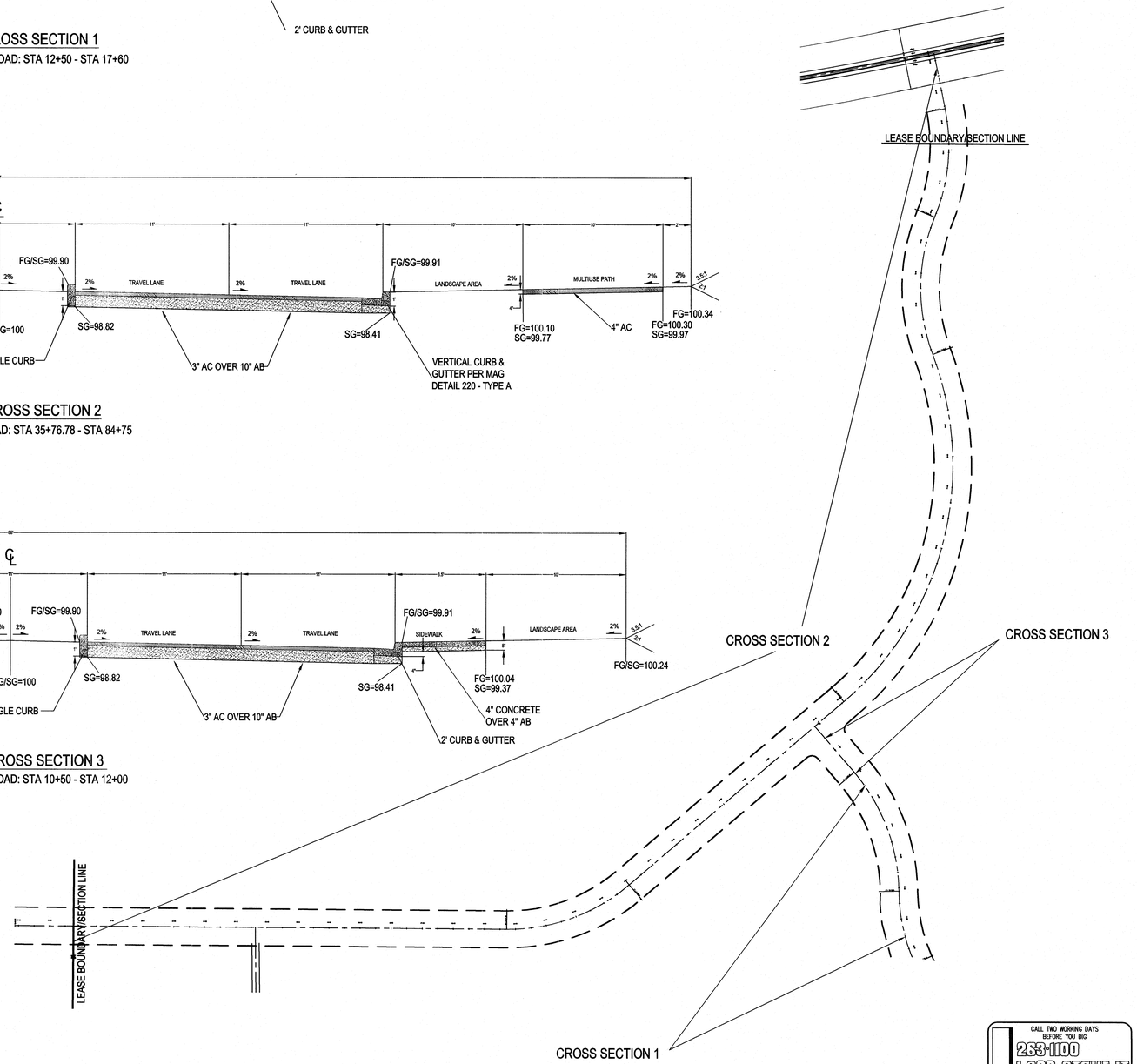

TYPICAL CROSS SECTION 2

MARINA ACCESS ROAD: STA 35+76.78 - STA 84+75




TYPICAL CROSS SECTION 3

RIVIERA ACCESS ROAD: STA 10+50 - STA 12+00

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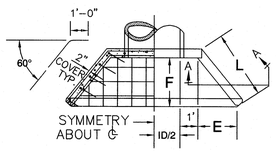
|---|---|---|---|---|
| DRAWN: SDF | HORZ. N.T.S. | 7958-02 | 6/8/16 | 3 OF 20 |
| CHECK: RLM | VERT. N.T.S. | | | |

REGISTERED PROFESSIONAL ENGINEER (CIVIL)
CERTIFICATE NO. 14395
R. LARRY MORSE
Date Signed 6/30/16
ARIZONA, U.S.A.
Expires 9/30/2018

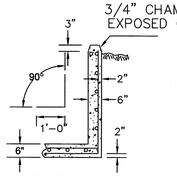
# HAVASU 280
# MARINA/RIVIERA ACCESS ROADS
# CROSS SECTION DETAILS
# SUBGRADE & FUTURE

| REV. NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 1 | 6/3/16 | LHC 5/15/16 COMMENTS | SDF |

# 1 HEADWALL DETAIL - MAG STD DETAIL 501-1

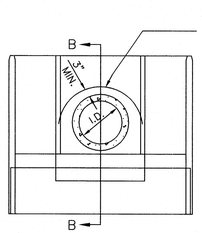



PLAN

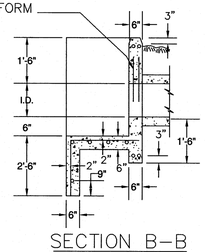



SECTION A–A

| PIPE | DIMENSIONS | | | QUANTITIES | | |
|---|---|---|---|---|---|---|
| I.D. | L | E | F (APRX) | CONC. (C.Y.) C.M.P. | R.C.P. | REINF. STL (LBS) |
| 36" | 4'-0" | 2'-0" | 3'-6" | 2.08 | 2.01 | 150 |




ELEVATION




SECTION B–B

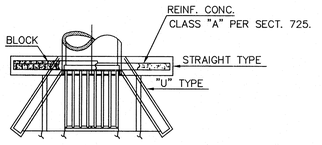
NOTES

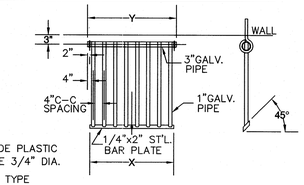
1. ALL CONCRETE SHALL BE CLASS A. PER SECT. 725.
2. ALL REINFORCING BARS SHALL BE NO. 4 EXCEPT NO. 6 BARS OVER PIPE. BAR SPACING APPROX. 1'0" C TO C UNLESS OTHERWISE NOTED.
3. 30° WING WALL FLARE SHOWN, 45° WING WALL REQUIRED

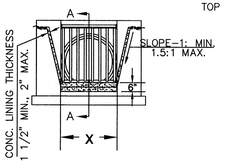
MAG DETAIL NO. 501-4

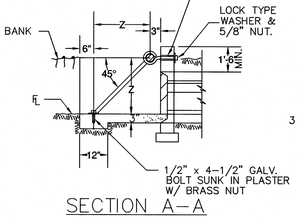
HEADWALL 18" TO 60" PIPE

# 2 TRASH RACK DETAIL - MAG STD DETAIL 502-2

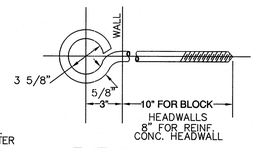



SECTION A–A



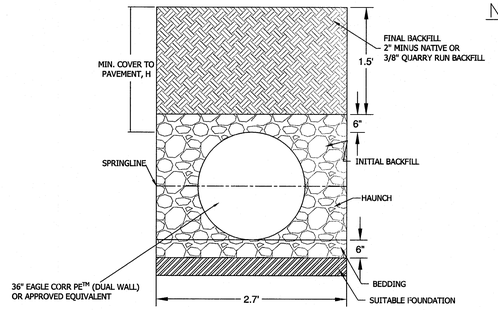

EYE BOLT

| TYPE BASED ON PIPE SIZE | | | | | | |
|---|---|---|---|---|---|---|
| TYPE | PIPE SIZE | NO. OF BARS | LENGTH OF BARS | DIMENSIONS X | Y | Z |
| C | 36" | 10 | 5'–1 1/2" | 3'–1" | 3'–9" | 3'–6" |

MAG DETAIL NO. 502–2

TRASH RACK

# 3 TRENCH INSTALLATION

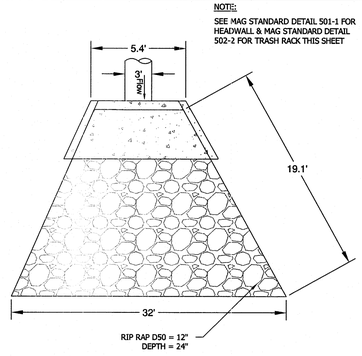



NOTES

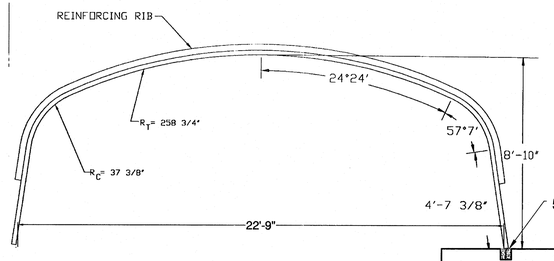
1. ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST ADDITION
2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL WHEN REQUIRED
3. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER, AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.
4. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I, II OR III. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER, UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 6" (150mm) FOR 30"–60" (750mm–900mm).
5. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I, II, OR III IN THE PIPE ZONE EXTENDING NO LESS THAN 6" ABOVE CROWN OF PIPE, THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER, MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.
6. MINIMUM COVER: MINIMUM COVER, H, IN NON–TRAFFIC APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" FROM THE TOP OF PIPE TO GROUND SURFACE, ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOTATION, FOR TRAFFIC APPLICATIONS, MINIMUM COVER, H, IS 12" UP TO 48" DIAMETER PIPE AND 24" OF COVER FOR 54"–60" DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT.

# 4 OUTLET PROTECTION DETAIL

NOTE:
SEE MAG STANDARD DETAIL 501-1 FOR HEADWALL & MAG STANDARD DETAIL 502-2 FOR TRASH RACK THIS SHEET




# 5 BOX CULVERT DETAIL

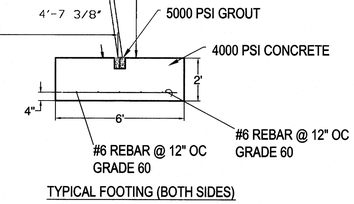



DL=((hS-A)y)/2

h = 8'-10" + 4'
S = 22'-9"
A = 189.8 SF
y = 110

DL = ((12.83 x 22.75 - 189.8) 110) / 2 = 5615 #/LF
LL = 64,000/(8+2 x 12.83) = 1901.4 #/LF

SIZE 22'–9" WIDE X 8'–10" HIGH
HS–20 LOAD RATING
CONTECH BOX CULVERT
STRUCTURE NUMBER 66–TYPE
B6 PLATE – PLAIN END
CONCRETE FOOTING PER
MANUFATURES SPECIFICATIONS
OR APPROVED EQUIVALENT




TYPICAL FOOTING (BOTH SIDES)

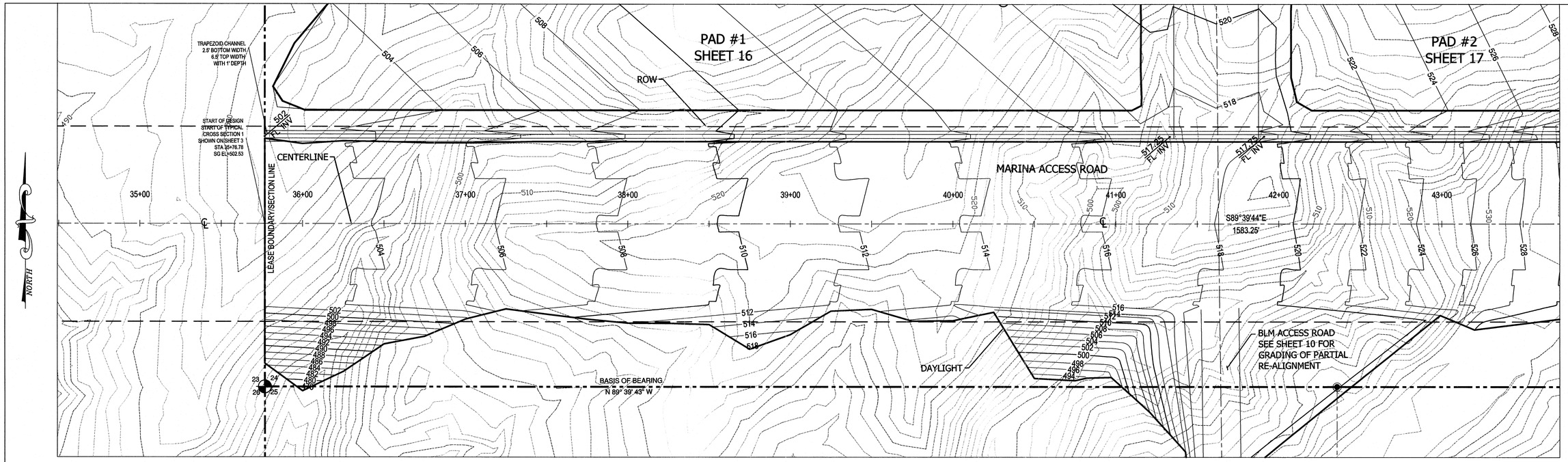

ARQ ENGINEERING LLC
Engineering and Survey
4440 HIGHWAY 95, SUITE A
FORT MOHAVE, ARIZONA 86429
PHONE: (928) 758-3333
FAX: (928) 758-8654

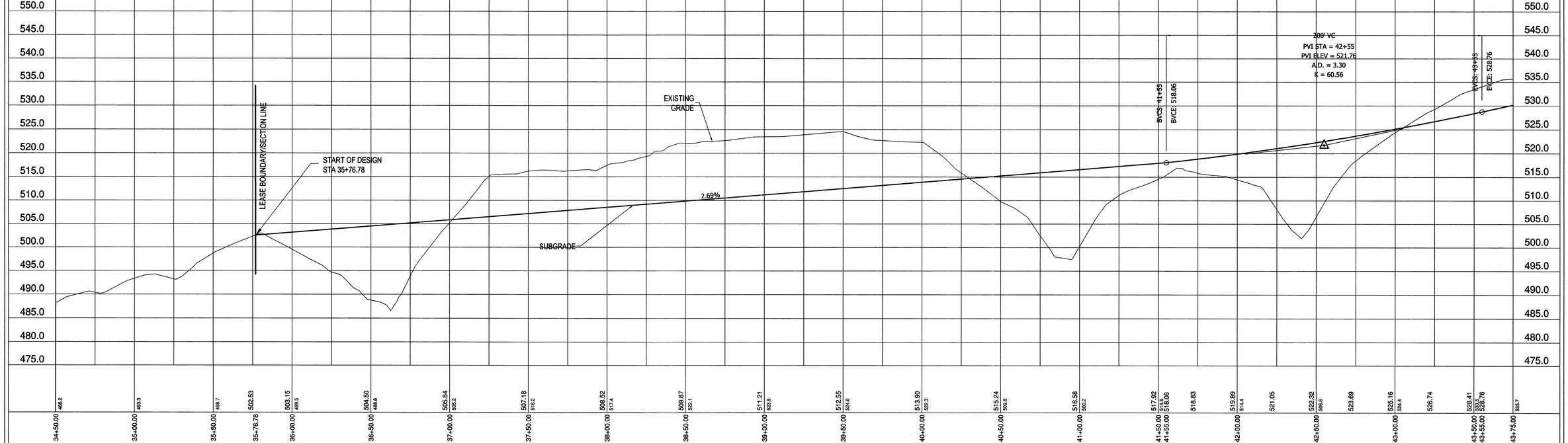

| DESIGN: | RLM | SCALE | | JOB NO. | DATE | SHEET |
|---|---|---|---|---|---|---|
| DRAWN: | SDF | HORZ. | N.T.S. | 7958-02 | 6/6/16 | 4 OF 20 |
| CHECK: | RLM | VERT. | N.T.S. | | | |

N:\7958-02\HAVASU 280\MICROSTATION\PLANS\ARQ_WORKING\MARINA-RIVIERA - ARQ - REV 5-28-16.PLANS

HAVASU 280
MARINS/RIVIERA ACCESS
DRAINAGE DETAILS

| REV. NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 1 | 6/3/16 | LHC 5/15/16 COMMENTS | SDF |




## LEGEND

- CENTERLINE STREET
- EXISTING GROUND CONTOURS
- PROPOSED GROUND CONTOURS
- RIGHT OF WAY

NOTE: SEE SHEET 3 FOR ROAD CROSS SECTIONS & STATIONING

## PLAN + PROFILE

HORIZONTAL SCALE: 1"=30'
VERTICAL SCALE: 1"=10'

CALL TWO WORKING DAYS BEFORE YOU DIG
263-1100
1-800-STAKE-IT
(OUTSIDE MARICOPA COUNTY)

| REV. NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 1 | 6/3/16 | LHC 5/15/16 COMMENTS | SDF |

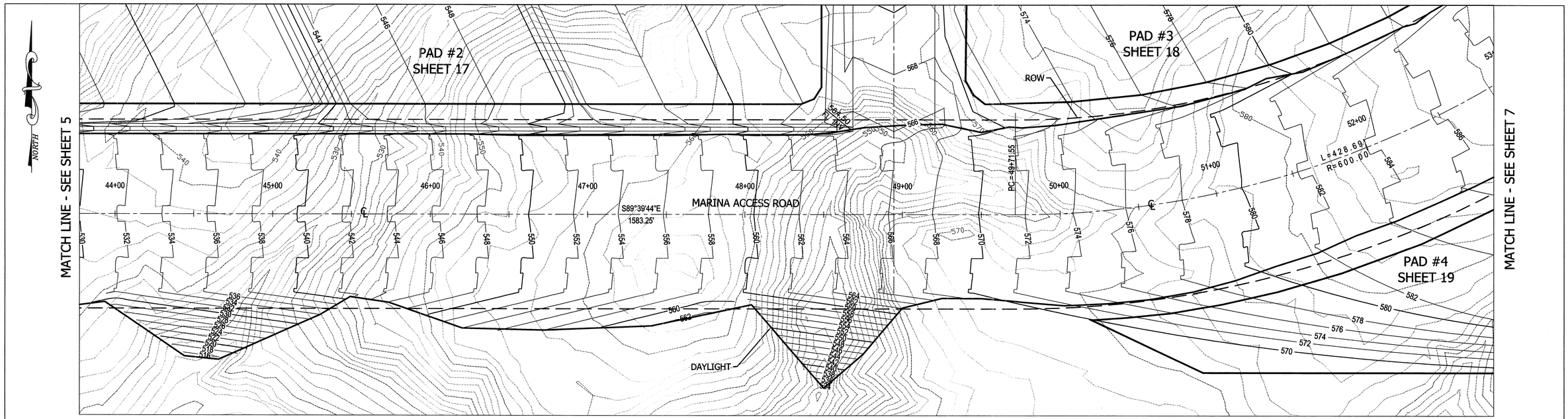
REGISTERED PROFESSIONAL ENGINEER (CIVIL)
CERTIFICATE NO.
14395
R. LARRY MORSE
Date Signed 6/8/16
ARIZONA, U.S.A.
Expires 9/30/2016

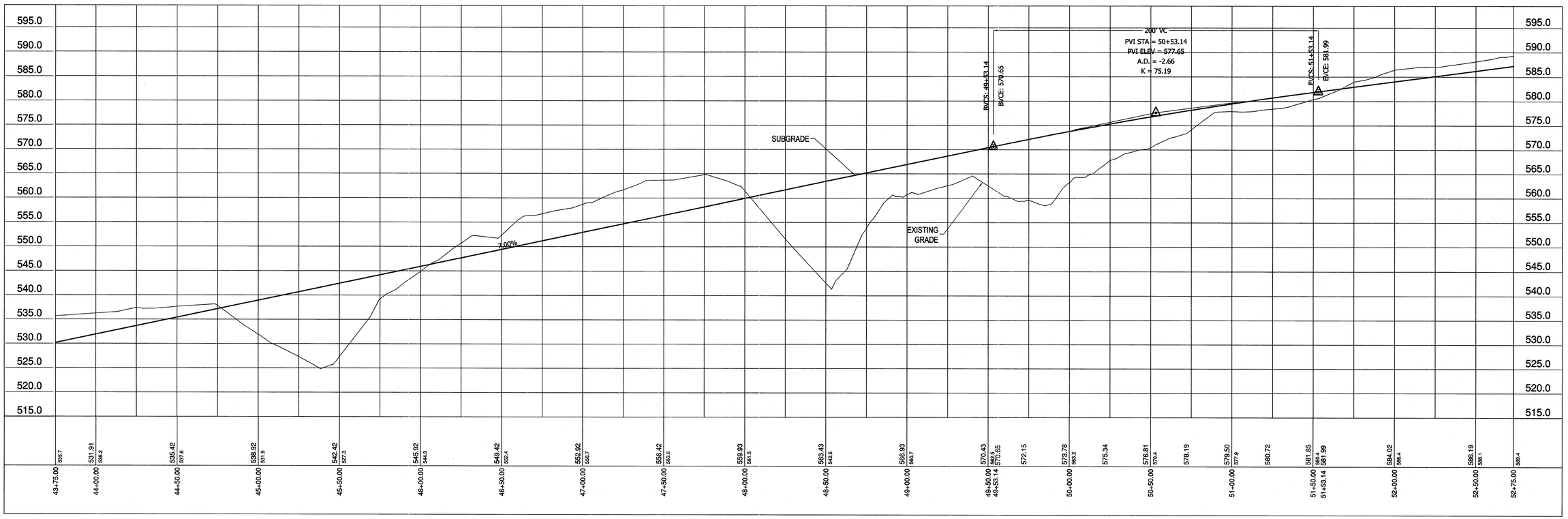
# MARINA ACCESS ROAD
## PLAN & PROFILE
## STA 35+76.78 – STA 43+75

| DESIGN: | RLM | SCALE | JOB NO. | DATE | SHEET |
|---|---|---|---|---|---|
| DRAWN: | SDF | HORZ. 1"=30' | 7958-02 | 6/8/16 | 5 OF 20 |
| CHECK: | RLM | VERT. 1"=10' | | | |

ARQ ENGINEERING LLC
Engineering and Survey
4440 HIGHWAY 95, SUITE A
FORT MOHAVE, ARIZONA 86426
(928)758-3333

N:7958-02HAVASU 280\IMPROVEMENTS\ARQ WORKING\MARINA-RIVIERA - ARQ REV 5-26-16 PLANS




N:7958-02HAVASU 280\IMPROVEMENTS\ARQ WORKING\MARINA-RIVIERA - ARQ REV 5-26-16 PLANS

## LEGEND

- CENTERLINE STREET (10+00 — 11+00)
- EXISTING GROUND CONTOURS
- PROPOSED GROUND CONTOURS
- RIGHT OF WAY

NOTE: SEE SHEET 3 FOR ROAD CROSS SECTIONS & STATIONING

## PLAN + PROFILE

HORIZONTAL SCALE: 1"=30'
VERTICAL SCALE: 1"=10'

CALL TWO WORKING DAYS BEFORE YOU DIG
263-1100
1-800-STAKE-IT
(OUTSIDE MARICOPA COUNTY)

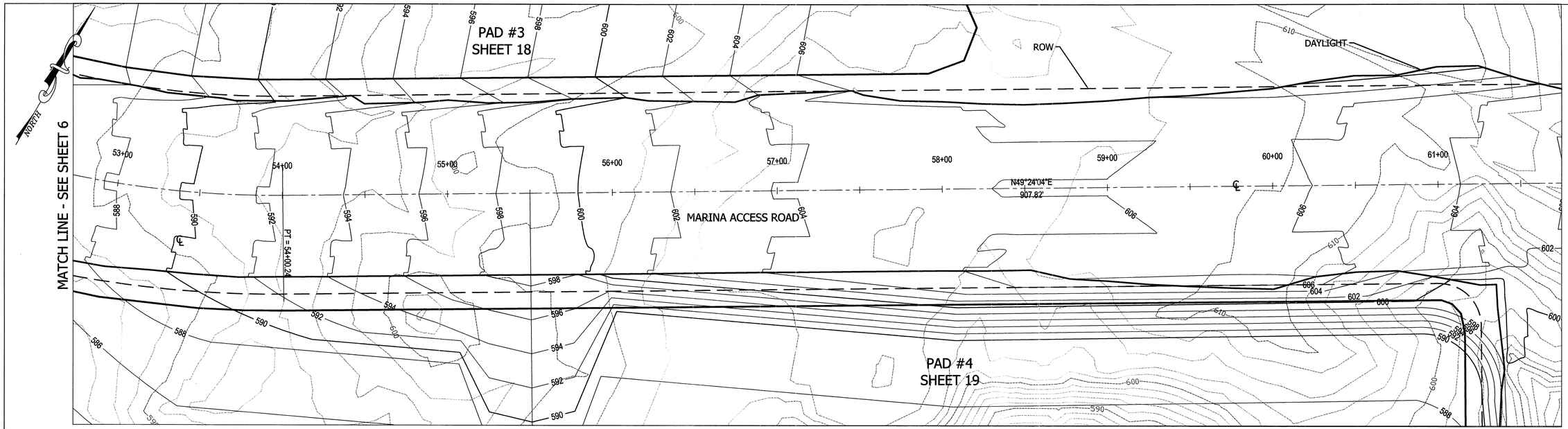
| REV. NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 1 | 6/3/16 | LHC 5/15/16 COMMENTS | SDF |

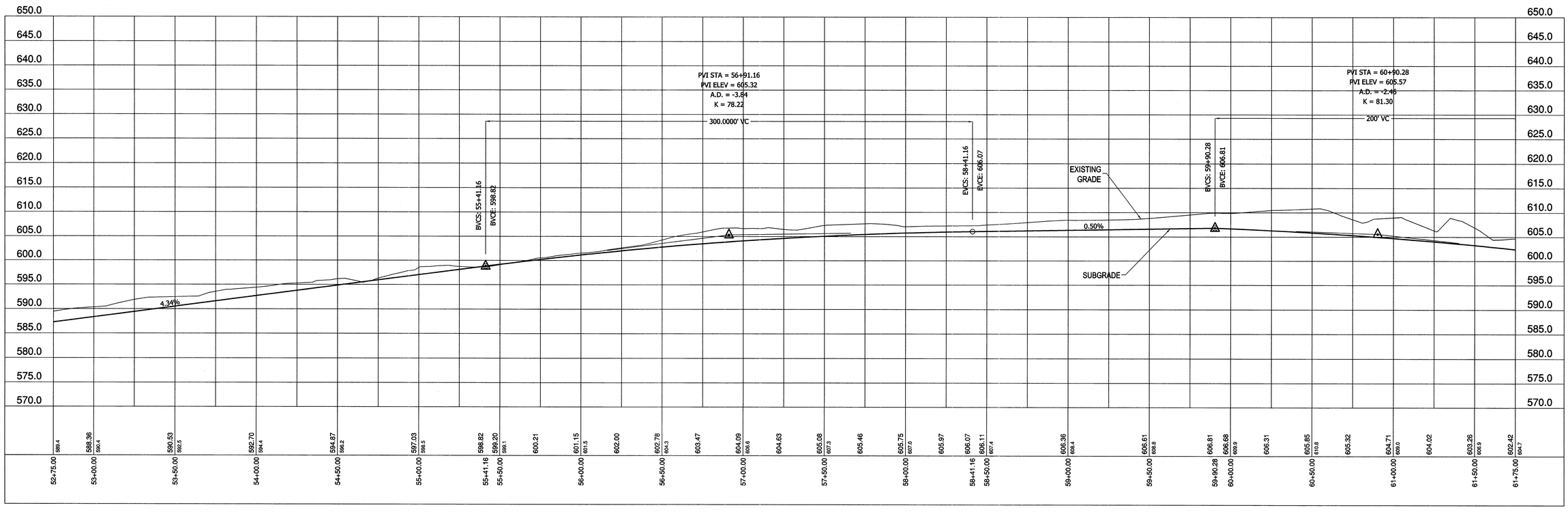
14395
R. LARRY MORSE
Date Signed 6/8/16
ARIZONA, U.S.A.
Expires 9/30/2018

# MARINA ACCESS ROAD
## PLAN & PROFILE
## STA 43+75 - STA 52+75

| | | | | | |
|---|---|---|---|---|---|
| DESIGN: RLM | SCALE | JOB NO. | DATE | SHEET |
| DRAWN: SDF | HORZ. 1"=30' | 7958-02 | 6/8/16 | 6 OF 20 |
| CHECK: RLM | VERT. 1"=10' | | | |

ARQ ENGINEERING LLC
Engineering and Survey
4440 HIGHWAY 95, SUITE A
FORT MOHAVE, ARIZONA 86426
(928)758-3333




## LEGEND

- CENTERLINE STREET
- EXISTING GROUND CONTOURS
- PROPOSED GROUND CONTOURS
- RIGHT OF WAY

NOTE: SEE SHEET 3 FOR ROAD CROSS SECTIONS & STATIONING

## PLAN + PROFILE

HORIZONTAL SCALE: 1"=30'
VERTICAL SCALE: 1"=10'

CALL TWO WORKING DAYS BEFORE YOU DIG
2-1-1
1-800-STAKE-IT
(OUTSIDE MARICOPA COUNTY)

| REV. NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 1 | 6/3/16 | LHC 5/15/16 COMMENTS | SDF |

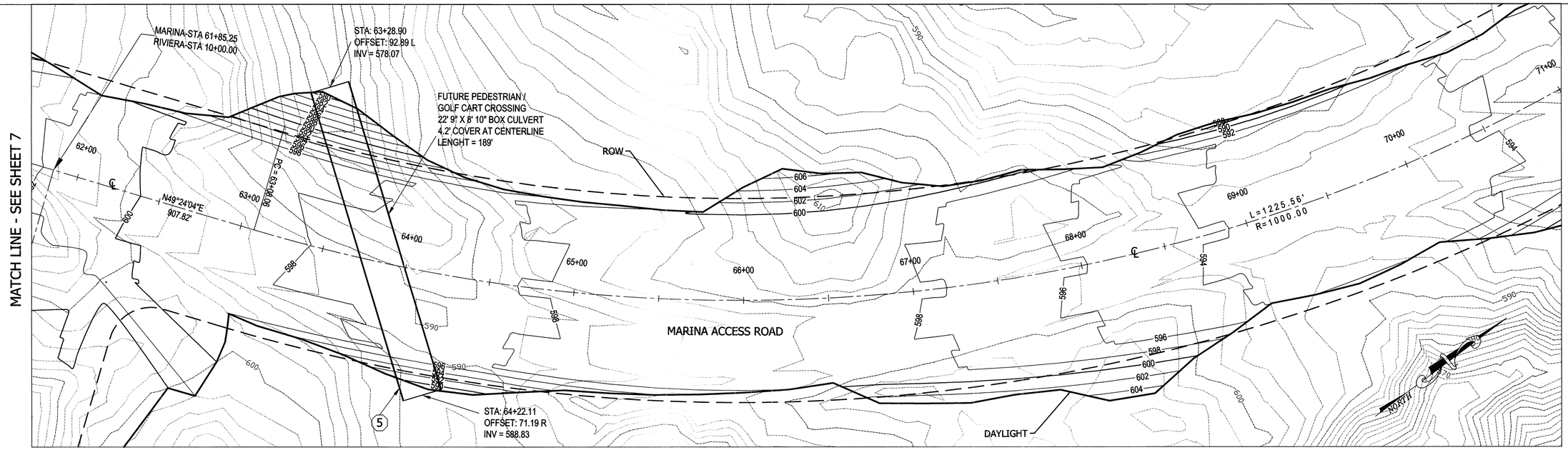
N:7958-02HAVASU 280\IMPROVEMENTS\ARQ WORKING\MARINA-RIVIERA - ARQ REV 5-26-16 PLANS

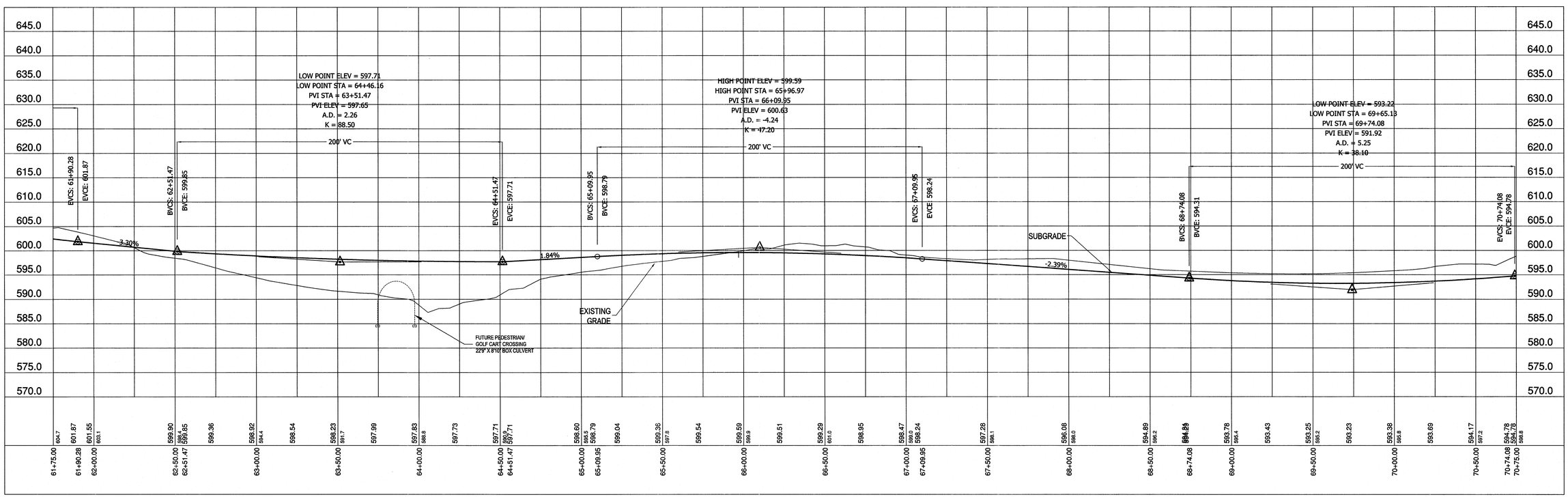
REGISTERED PROFESSIONAL ENGINEER (CIVIL)
CERTIFICATE NO.
14395
R. LARRY MORSE
Date Signed 6-8-16
ARIZONA, U.S.A.
Expires 9/30/2016

# MARINA ACCESS ROAD
## PLAN & PROFILE
## STA 52+75 - STA 61+75

| DESIGN: | RLM | SCALE | JOB NO. | DATE | SHEET |
|---|---|---|---|---|---|
| DRAWN: | SDF | HORZ. 1"=30' | 7958-02 | 6/8/16 | 7 OF 20 |
| CHECK: | RLM | VERT. 1"=10' | | | |

ARQ ENGINEERING LLC
Engineering and Survey
4440 HIGHWAY 95, SUITE A
FORT MOHAVE, ARIZONA 86426
(928)758-3333




## DRAINAGE KEYNOTES

1. TRENCH INSTALLATION - SEE DETAIL SHEET 4
2. HEADWALL - SEE DETAIL SHEET 4
3. TRASH RACK - SEE DETAIL SHEET 4
4. OUTLET PROTECTION - SEE DETAIL SHEET 4
5. BOX CULVERT - SEE DETAIL SHEET 4

## LEGEND

- CENTERLINE STREET (10+00 — 11+00)
- EXISTING GROUND CONTOURS
- PROPOSED GROUND CONTOURS
- RIGHT OF WAY

NOTE: SEE SHEET 3 FOR ROAD CROSS SECTIONS & STATIONING

## PLAN + PROFILE

HORIZONTAL SCALE: 1"=30'
VERTICAL SCALE: 1"=10'

CALL TWO WORKING DAYS BEFORE YOU DIG
263-1100
1-800-STAKE-IT
(OUTSIDE MARICOPA COUNTY)

| REV. NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 1 | 6/3/16 | LHC 5/15/16 COMMENTS | SDF |

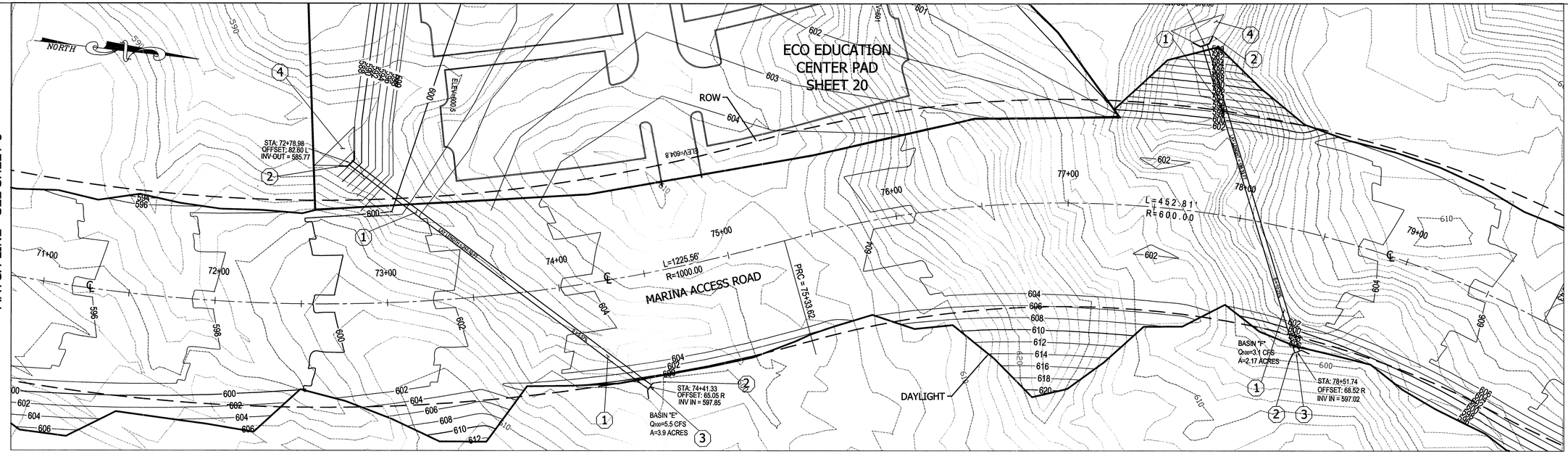
N:7958-02HAVASU 280\IMPROVEMENTS\ARQ WORKING\MARINA-RVIERA - ARQ -REV 5-26-16 PLANS

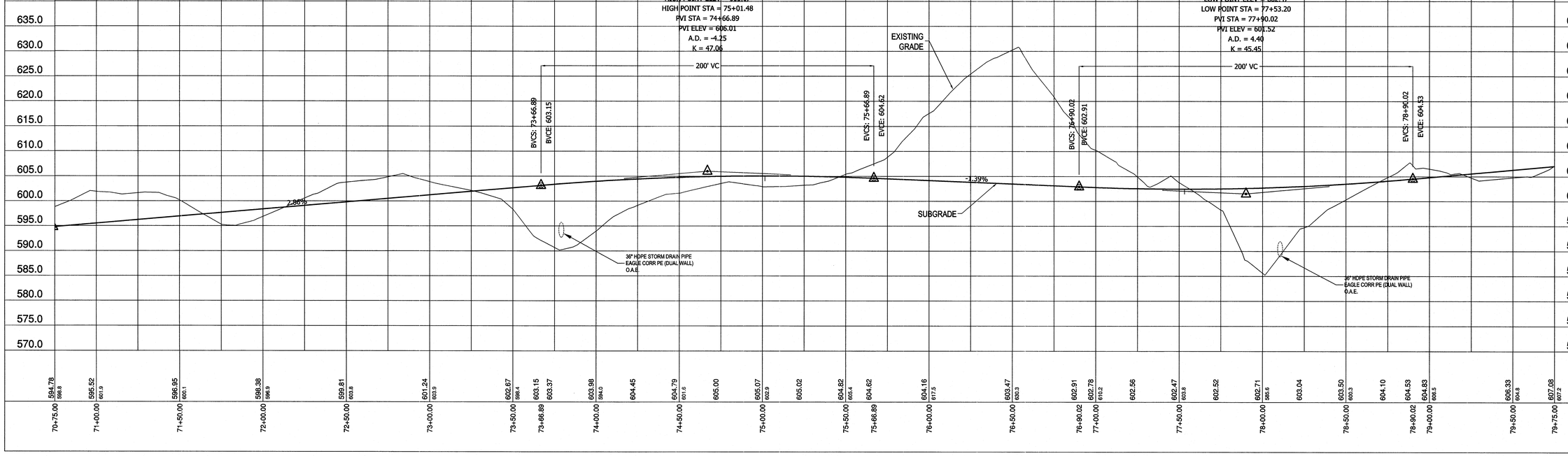
REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 14395 R. LARRY MORSE Date Signed 6-8-16 ARIZONA, U.S.A. Expires 9/30/2016

# MARINA ACCESS ROAD PLAN & PROFILE STA 61+75 — STA 70+75

| DESIGN: | RLM | SCALE | JOB NO. | DATE | SHEET |
|---|---|---|---|---|---|
| DRAWN: | SDF | HORZ. 1"=30' | 7958-02 | 6/8/16 | 8 OF 20 |
| CHECK: | RLM | VERT. 1"=10' | | | |

ARQ ENGINEERING LLC
Engineering and Survey
4440 HIGHWAY 95, SUITE A
FORT MOHAVE, ARIZONA 86426
(928)758-3333




## DRAINAGE KEYNOTES

1. TRENCH INSTALLATION - SEE DETAIL SHEET 4
2. HEADWALL - SEE DETAIL SHEET 4
3. TRASH RACK - SEE DETAIL SHEET 4
4. OUTLET PROTECTION - SEE DETAIL SHEET 4

## LEGEND

- 10+00 — 11+00 — CENTERLINE STREET
- EXISTING GROUND CONTOURS
- PROPOSED GROUND CONTOURS
- RIGHT OF WAY

NOTE: SEE SHEET 3 FOR ROAD CROSS SECTIONS & STATIONING

## PLAN + PROFILE

HORIZONTAL SCALE: 1"=30'
VERTICAL SCALE: 1"=10'

CALL TWO WORKING DAYS BEFORE YOU DIG
2-1-1 OR 1-800-STAKE-IT
(OUTSIDE MARICOPA COUNTY)

| REV. NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 1 | 6/3/16 | LHC 5/15/16 COMMENTS | SDF |

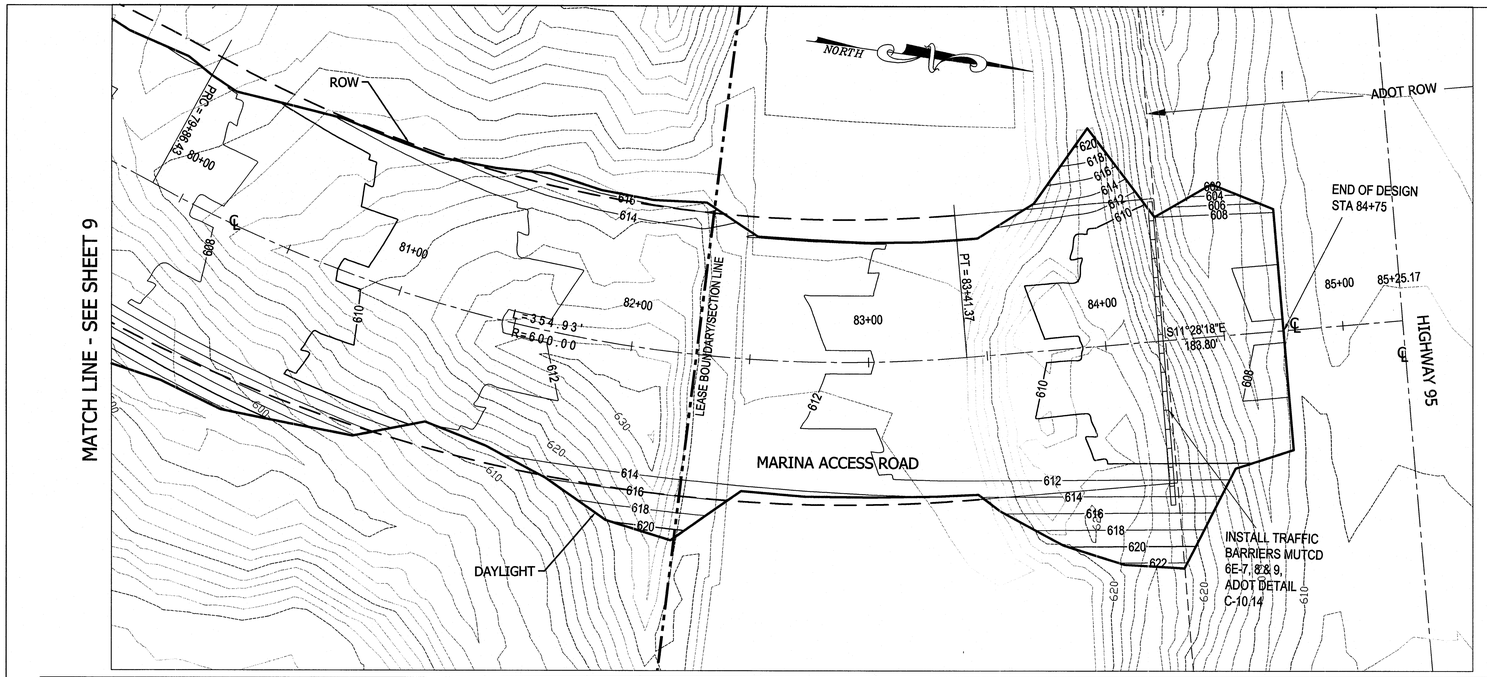
N:\7958-02HAVASU 280\IMPROVEMENTS\ARQ WORKING\MARINA-RIVIERA - ARQ REV 5-26-16 PLANS

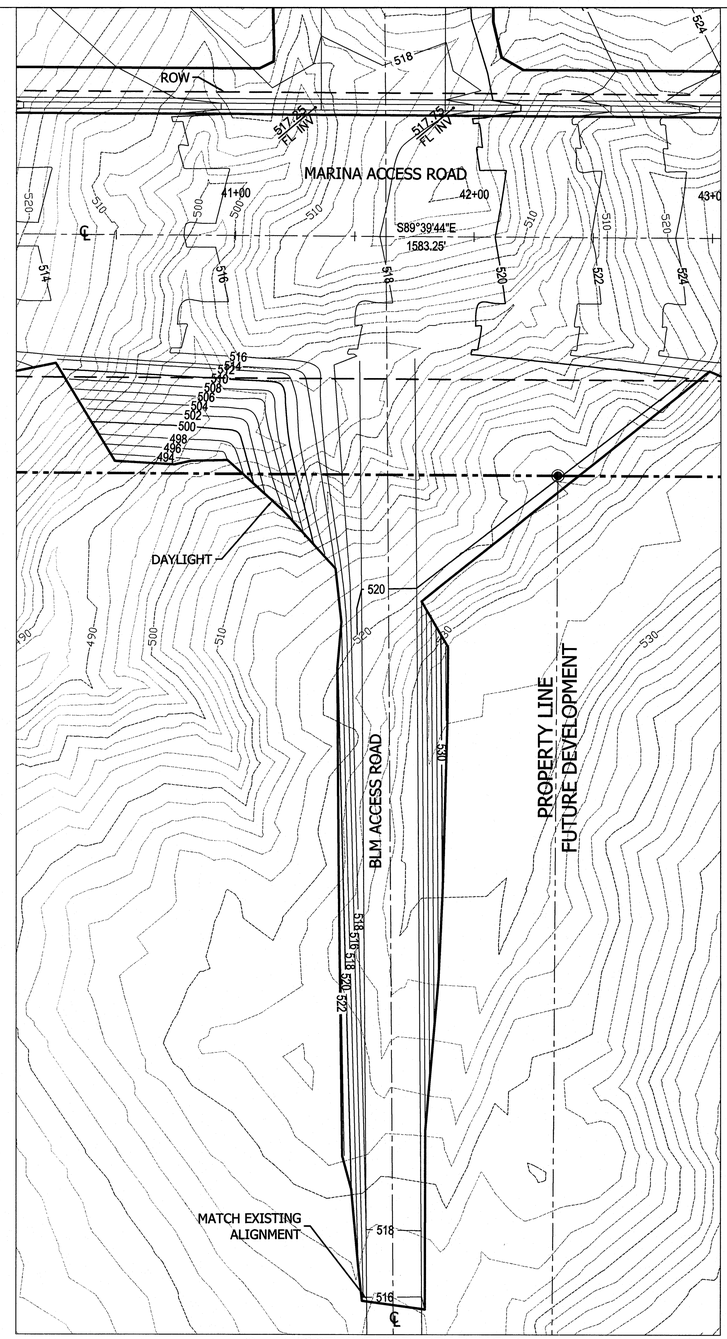
REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 14395 R. LARRY MORSE Date Signed 6/3/16 ARIZONA, U.S.A. Expires 9/30/2016

# MARINA ACCESS ROAD PLAN & PROFILE STA 70+75 - STA 79+75

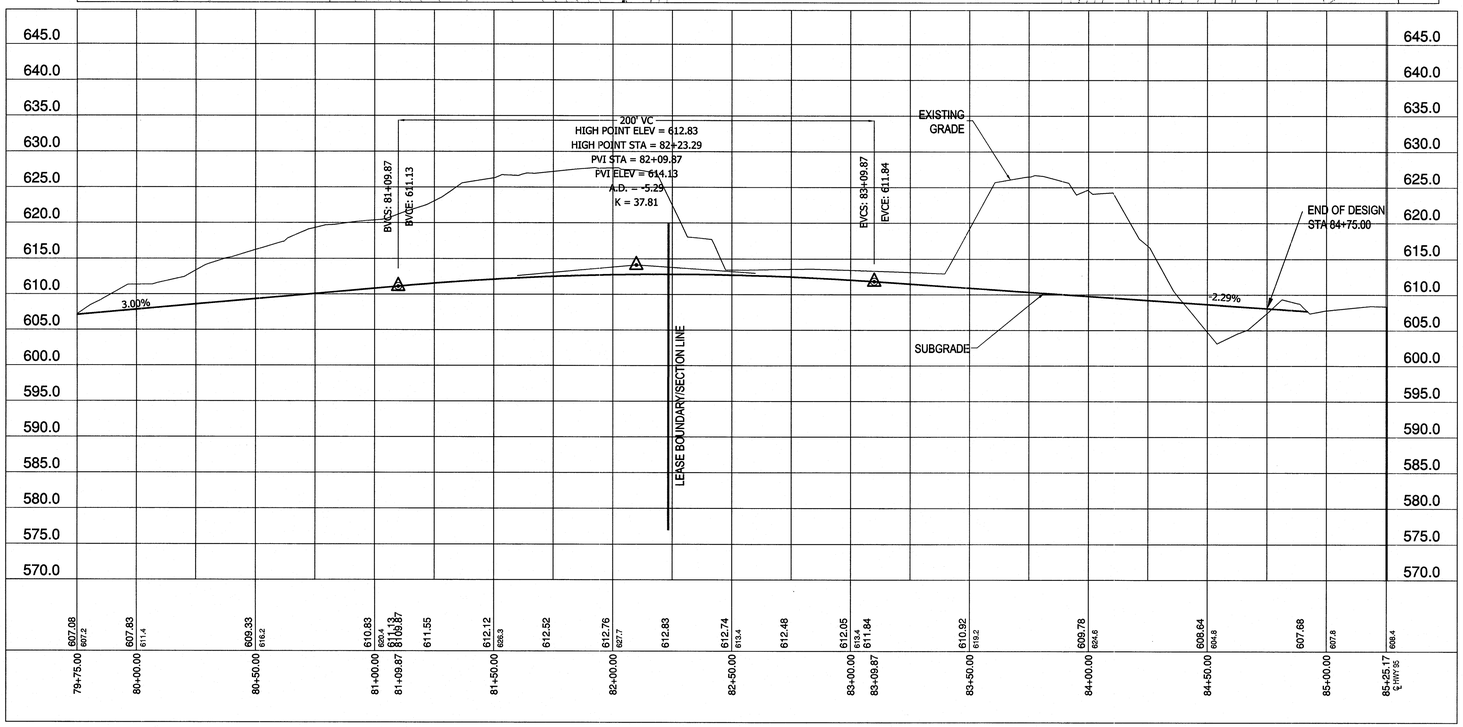
| DESIGN: | RLM | SCALE | JOB NO. | DATE | SHEET |
|---|---|---|---|---|---|
| DRAWN: | SDF | HORZ. 1"=30' | 7958-02 | 6/8/16 | 9 OF 20 |
| CHECK: | RLM | VERT. 1"=10' | | | |

ARQ ENGINEERING LLC
Engineering and Survey
4440 HIGHWAY 95, SUITE A
FORT MOHAVE, ARIZONA 86426
(928)758-3333




BLM ACCESS ROAD GRADING PLAN
FOR PARTIAL RE-ALIGNMENT




## LEGEND

- CENTERLINE STREET
- EXISTING GROUND CONTOURS
- PROPOSED GROUND CONTOURS
- RIGHT OF WAY

NOTE: SEE SHEET 3 FOR ROAD CROSS SECTIONS & STATIONING

## PLAN + PROFILE

HORIZONTAL SCALE: 1"=30'
VERTICAL SCALE: 1"=10'

CALL TWO WORKING DAYS BEFORE YOU DIG
263-1100
1-800-STAKE-IT
(OUTSIDE MARICOPA COUNTY)

| REV. NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 1 | 6/3/16 | LHC 5/15/16 COMMENTS | SDF |

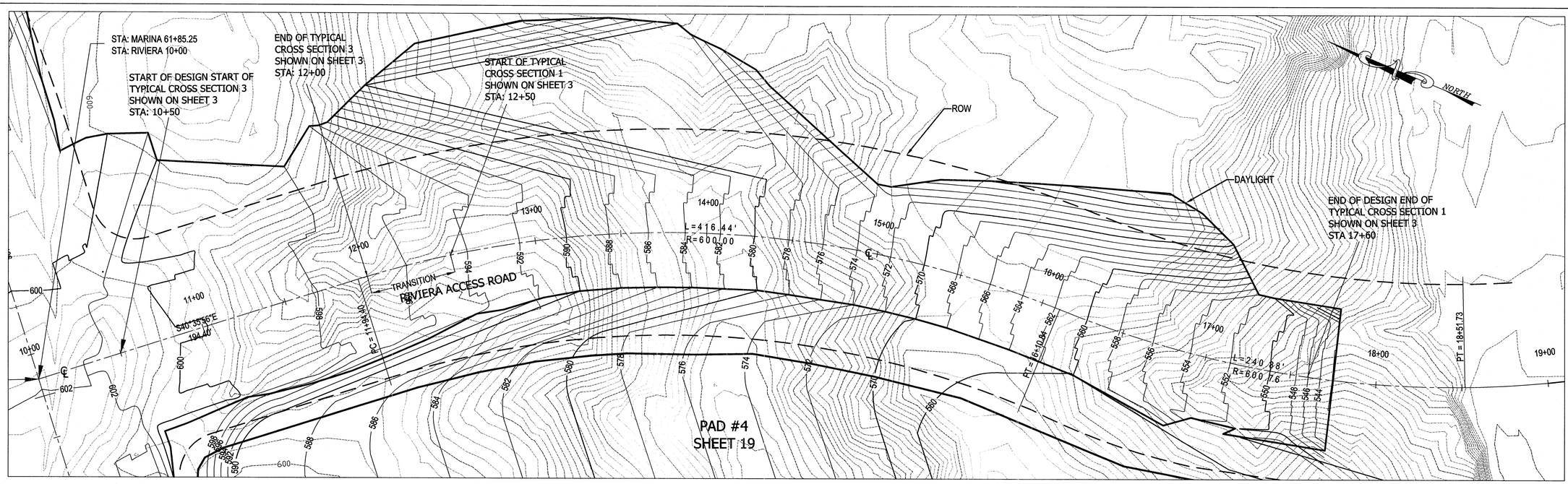
REGISTERED PROFESSIONAL ENGINEER (CIVIL)
CERTIFICATE NO.
14395
R. LARRY MORSE
Registered
ARIZONA, U.S.A.
Expires 9/30/2016

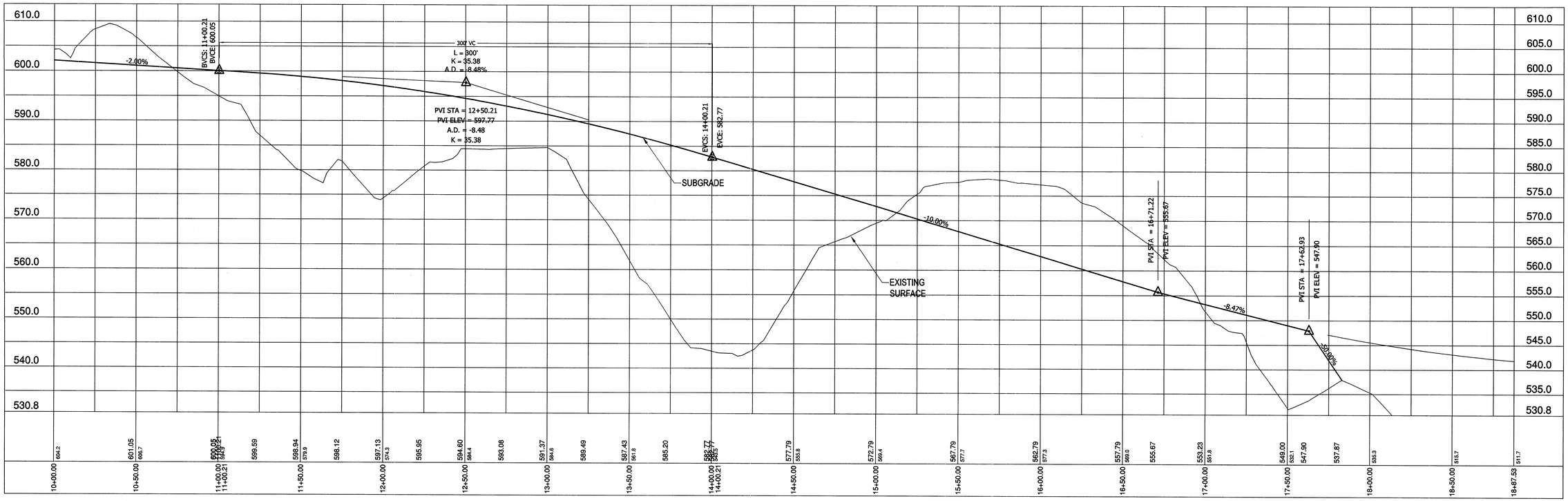
N:\7958-02HAVASU 280\IMPROVEMENTS\ARQ WORKING\MARINA-RIVIERA - ARQ REV 5-2616 PLANS

# MARINA ACCESS ROAD
## PLAN & PROFILE
## STA 79+75 — STA 84+75

| | | | | | |
|---|---|---|---|---|---|
| DESIGN: RLM | SCALE | JOB NO. | DATE | SHEET |
| DRAWN: SDF | HORZ. 1"=30' | 7958-02 | 6/8/16 | 10 OF 20 |
| CHECK: RLM | VERT. 1"=10' | | | |

ARQ ENGINEERING LLC
Engineering and Survey
4440 HIGHWAY 95, SUITE A
FORT MOHAVE, ARIZONA 86426
(928)758-3333




## LEGEND

- CENTERLINE STREET (10+00 — 11+00)
- EXISTING GROUND CONTOURS
- PROPOSED GROUND CONTOURS
- RIGHT OF WAY

NOTE: SEE SHEET 3 FOR ROAD CROSS SECTIONS & STATIONING

## PLAN + PROFILE

VERTICAL SCALE: 1"=10'
HORIZONTAL SCALE: 1"=30'

CALL TWO WORKING DAYS BEFORE YOU DIG
2&3-1100
1-800-STAKE-IT
(OUTSIDE MARICOPA COUNTY)

| REV. NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 1 | 6/3/16 | LHC 5/15/16 COMMENTS | SDF |

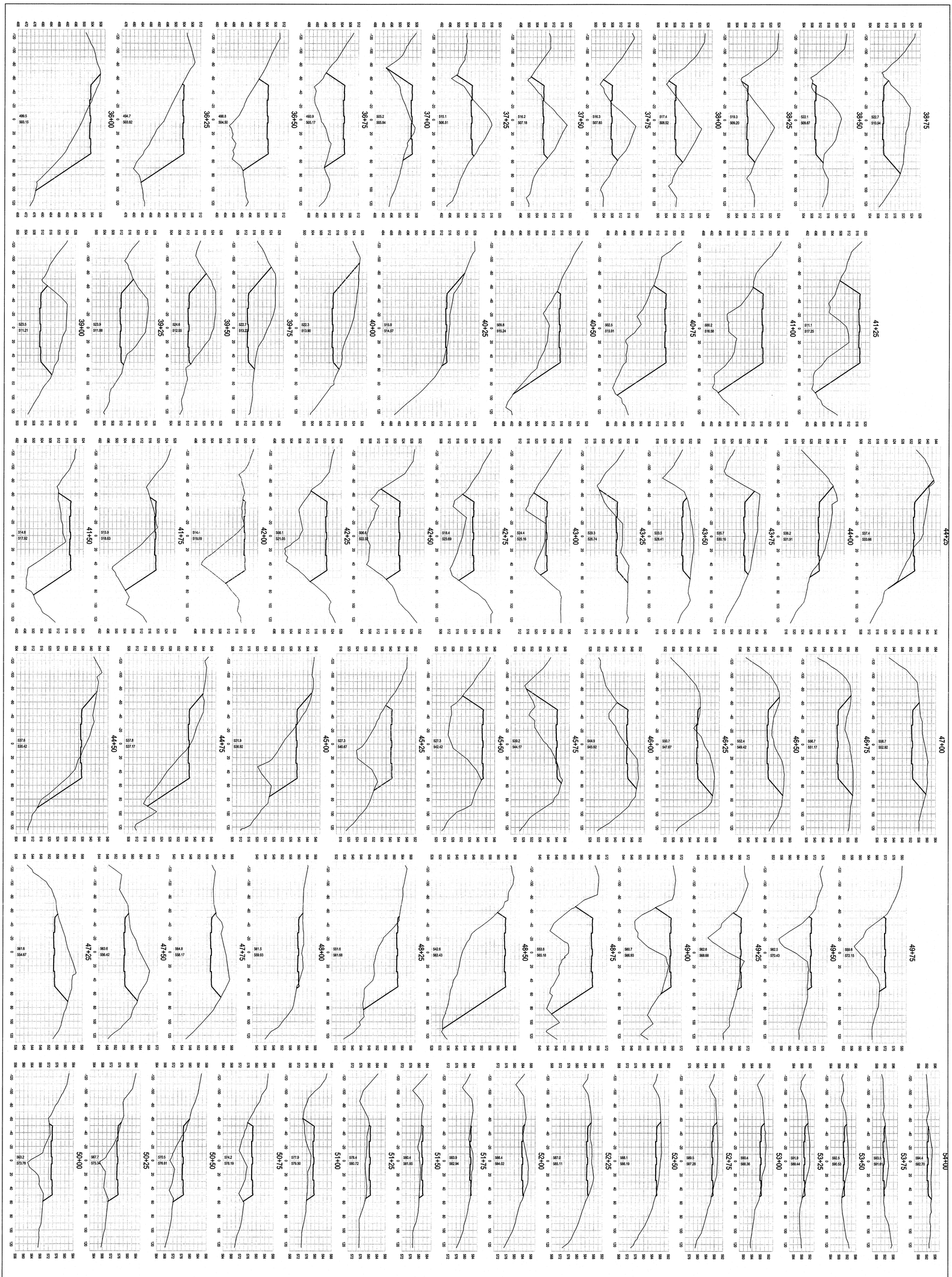
REGISTERED PROFESSIONAL ENGINEER — CERTIFICATE NO. — R. LARRY MORSE — 14395 — Date Signed 6/8/16 — ARIZONA, U.S.A. — Expires 9/30/2016

# RIVIERA ACCESS ROAD
## PLAN & PROFILE
## STA 10+50 — STA 17+60

| | | | | | |
|---|---|---|---|---|---|
| DESIGN: RLM | SCALE | JOB NO. | DATE | SHEET |
| DRAWN: SDF | HORZ. 1"=30' | 7958-02 | 6/8/16 | 11 OF 20 |
| CHECK: RLM | VERT. 1"=10' | | | |

ARQ ENGINEERING LLC
Engineering and Survey
4440 HIGHWAY 95, SUITE A
FORT MOHAVE, ARIZONA 86426
(928)758-3333

N:7958-02HAVASU 280\IMPROVEMENTS\ARQ WORKING\MARINA-RIVIERA - ARQ REV 5-26-16 PLANS




N:\7958-02\HAVASU 280\IMPROVEMENTS\ARQ WORKING\MARINA-RIVIERA - ARQ REV 5-26-16 PLANS

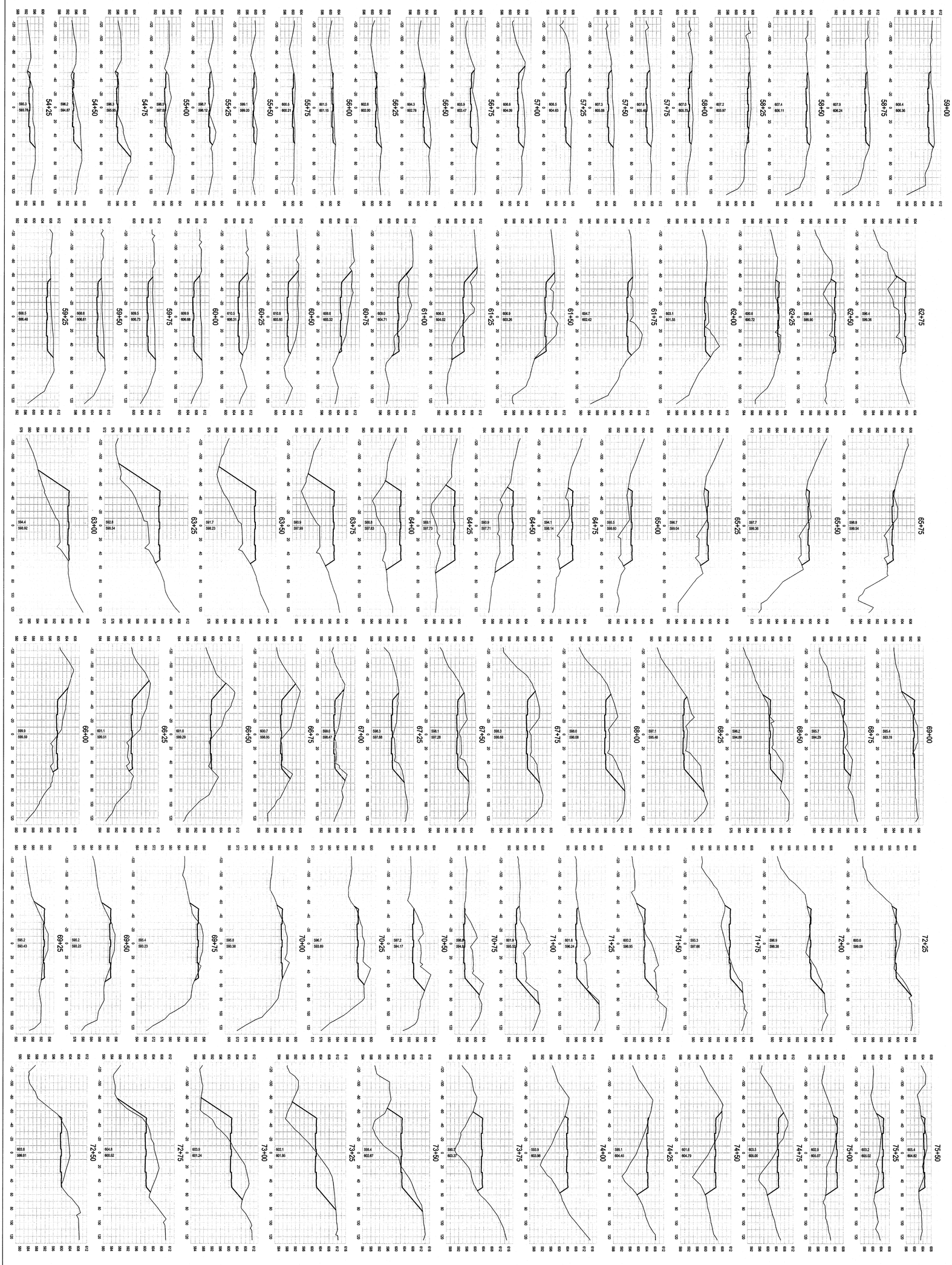
| REV. NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 1 | 6/3/16 | LHC 5/15/16 COMMENTS | SDF |

# HAVASU 280
# MARINA ACCESS ROAD
# SUBGRADE CROSS SECTIONS
# STA 36+00 – STA 54+00

REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 14395 R. LARRY MORSE ARIZONA, U.S.A. Expires 9/30/2018


ARQ ENGINEERING LLC
Engineering and Survey
4440 HIGHWAY 95, SUITE A
FORT MOHAVE, ARIZONA 86429
PHONE: (928) 758-3333
FAX: (928) 758-8654


| DESIGN: | RLM | SCALE | | JOB NO. | DATE | SHEET |
|---|---|---|---|---|---|---|
| DRAWN: | SDF | HORZ. | 1"=60' | 7958-02 | 6/8/16 | 12 OF 20 |
| CHECK: | RLM | VERT. | 1"=20' | | | |




N:\7958-02\HAVASU 280\IMPROVEMENTS\ARQ WORKING\MARINA-RIVIERA - ARQ REV 5-26-16 PLANS

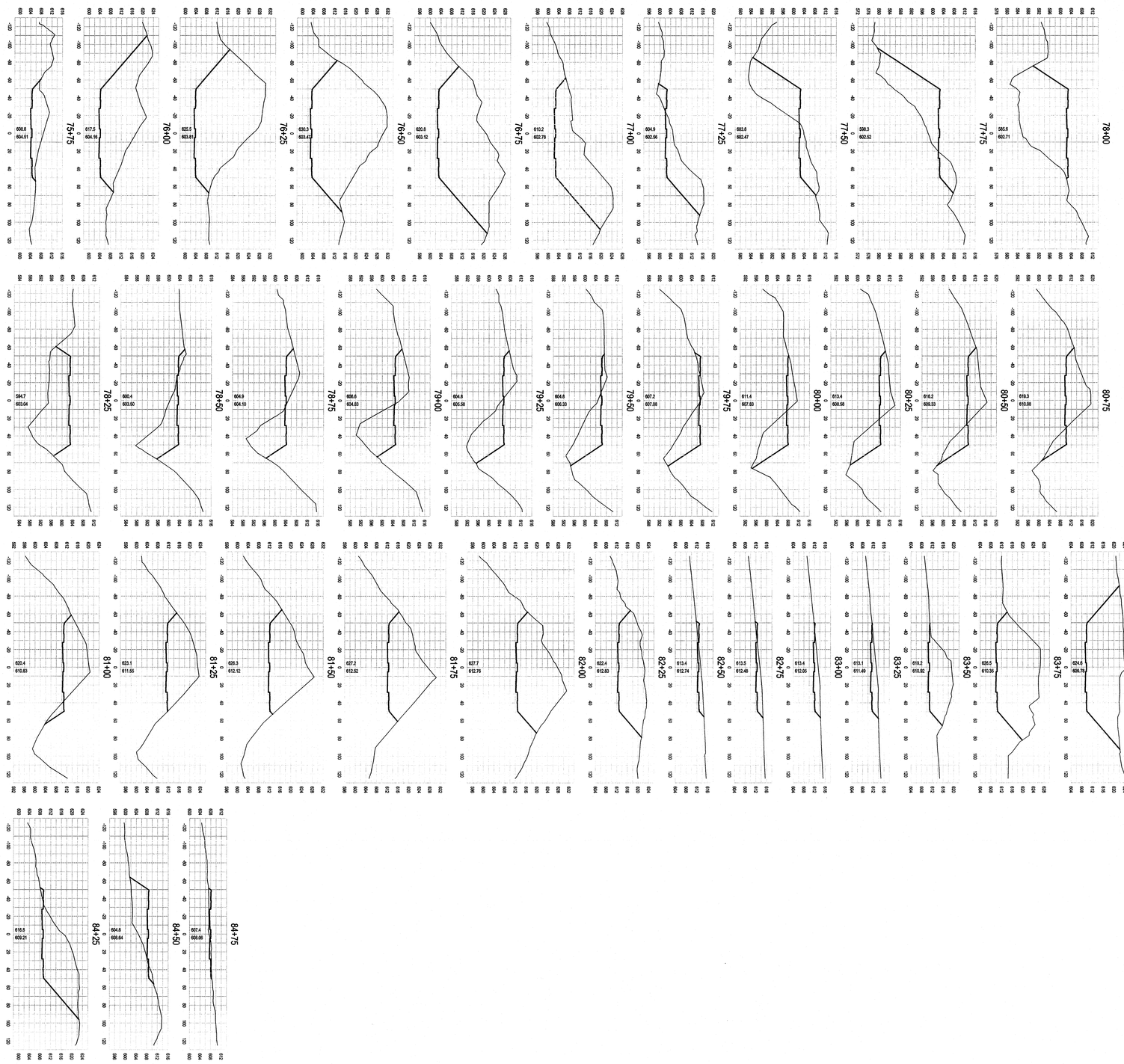
| REV. NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 1 | 6/3/16 | LHC 5/15/16 COMMENTS | SDF |

# HAVASU 280
# MARINA ACCESS ROAD
# SUBGRADE CROSS SECTIONS
# STA 54+25 – STA 75+50


ARQ ENGINEERING LLC
Engineering and Survey
4440 HIGHWAY 95, SUITE A
FORT MOHAVE, ARIZONA 86429
PHONE: (928) 758-3333
FAX: (928) 758-8654


REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 14395 R. LARRY MORSE ARIZONA, U.S.A. Expires 9/30/2018

| DESIGN: | RLM | SCALE | | JOB NO. | DATE | SHEET |
|---|---|---|---|---|---|---|
| DRAWN: | SDF | HORZ. | 1"=60' | 7958-02 | 6/8/16 | 13 OF 20 |
| CHECK: | RLM | VERT. | 1"=20' | | | |




H:\7958-02\HAVASU 280\IMPROVEMENTS\ARQ WORKING\MARINA-RIVIERA - ARQ REV 5-26-16 PLANS

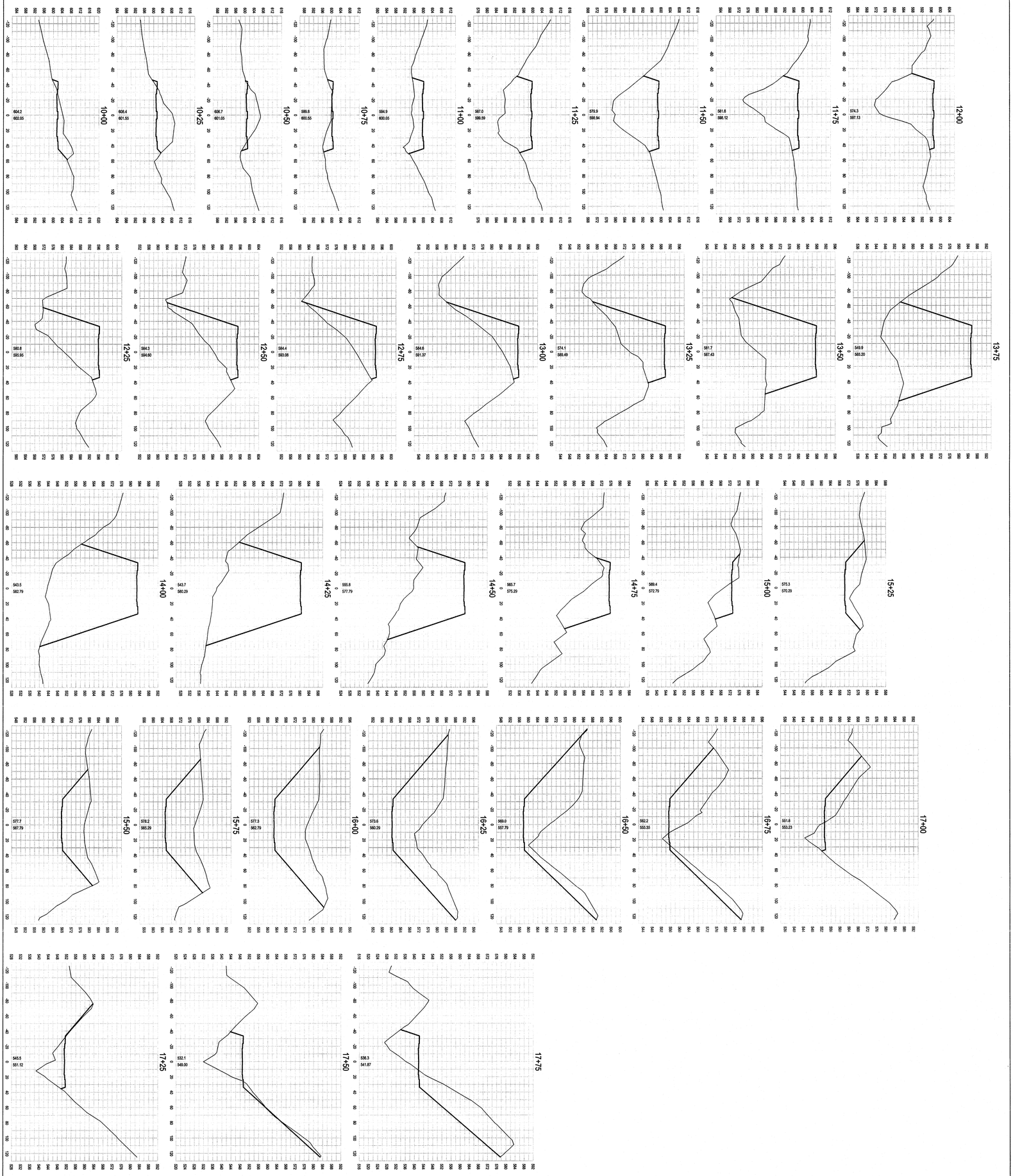
| REV. NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 1 | 6/3/16 | LHC 5/15/16 COMMENTS | SDF |

# HAVASU 280
# MARINA ACCESS ROAD
# SUBGRADE CROSS SECTIONS
# STA 75+75 - STA 84+75

REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 14395 R. LARRY MORSE ARIZONA, U.S.A. Expires 9/30/2018


ARQ ENGINEERING LLC
Engineering and Survey
4440 HIGHWAY 95, SUITE A
FORT MOHAVE, ARIZONA 86429
PHONE: (928) 758-3333
FAX: (928) 758-8654


| DESIGN: | RLM | SCALE | | JOB NO. | DATE | SHEET |
|---|---|---|---|---|---|---|
| DRAWN: | SDF | HORZ. | 1"=60' | 7958-02 | 6/8/16 | 14 OF 20 |
| CHECK: | RLM | VERT. | 1"=20' | | | |




N:\7958-02\HAVASU 280\IMPROVEMENTS\ARQ WORKING\MARINA-RIVIERA - ARQ REV 5-26-16 PLANS

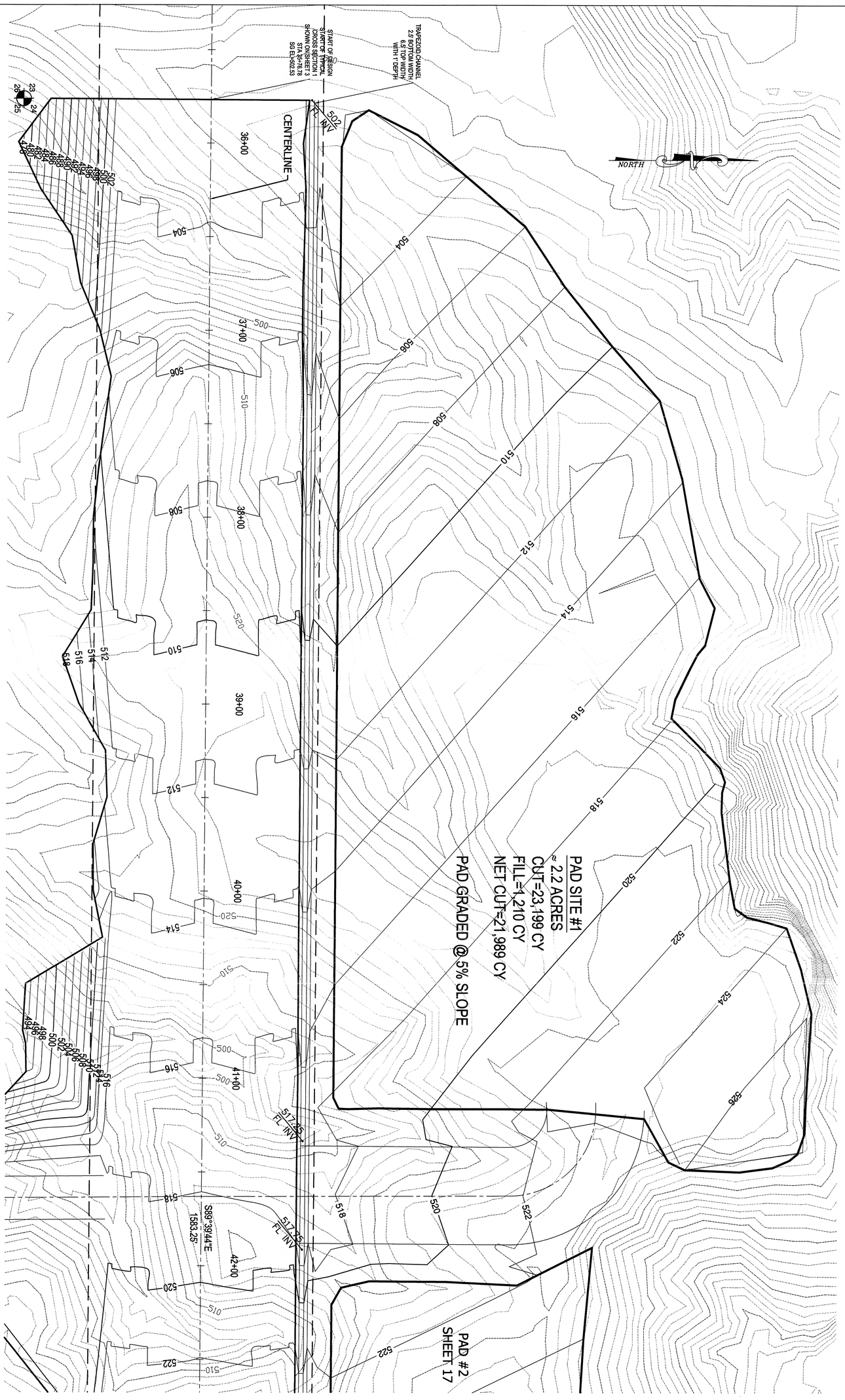
| REV. NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 1 | 6/3/16 | LHC 5/15/16 COMMENTS | SDF |

# HAVASU 280
## RIVIERA ACCESS ROAD
## SUBGRADE CROSS SECTIONS
## STA 10+00 – STA 17+75

REGISTERED PROFESSIONAL ENGINEER (CIVIL)
CERTIFICATE NO.
14395
R. LARRY MORSE
ARIZONA, U.S.A.
Expires 9/30/2018


ARQ ENGINEERING LLC
Engineering and Survey
4440 HIGHWAY 95, SUITE A
FORT MOHAVE, ARIZONA 86429
PHONE: (928) 758-3333
FAX: (928) 758-8654


| DESIGN: | RLM | SCALE | | JOB NO. | DATE | SHEET |
|---|---|---|---|---|---|---|
| DRAWN: | SDF | HORZ. | 1"=60' | 7958-02 | 6/8/16 | 15 OF 20 |
| CHECK: | RLM | VERT. | 1"=20' | | | |




| REV. NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 1 | 6/3/16 | LHC 5/15/16 COMMENTS | SDF |

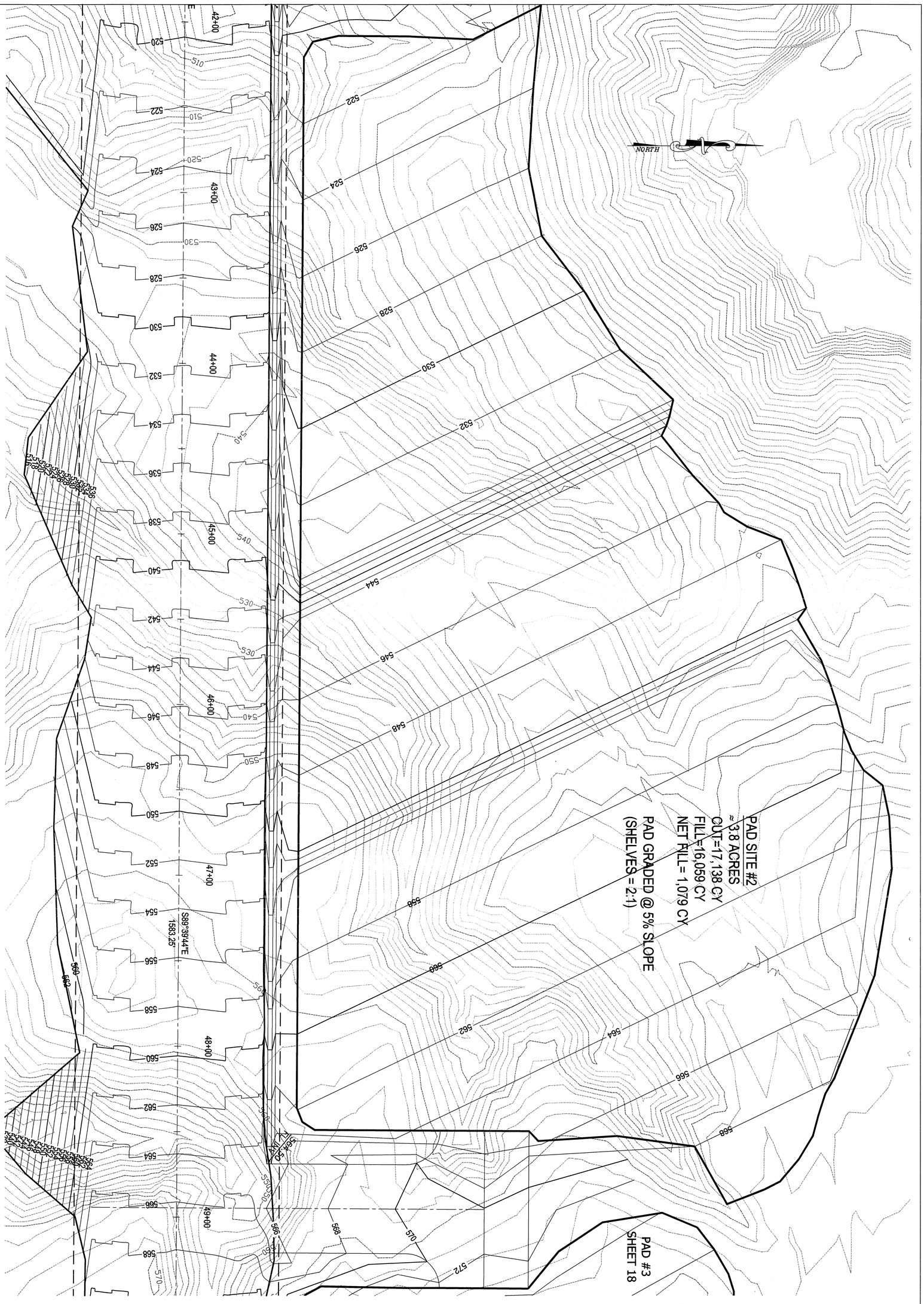
# HAVASU 280
# MARINA/RIVIERA ACCESS
# MULTI-USE PAD #1
# GRADING PLAN

N:\7958-02\HAVASU 280\IMPROVEMENTS\ARQ WORKING\MARINA-RIVIERA - ARQ -REV 5-26-16 PLANS

REGISTERED PROFESSIONAL ENGINEER (CIVIL)
CERTIFICATE
14395
R. LARRY MORSE
ARIZONA, U.S.A.
Expires 9/30/2016

ARQ ENGINEERING LLC
Engineering and Survey
4440 HIGHWAY 95, SUITE A
FORT MOHAVE, ARIZONA 86429
PHONE: (928) 758-3333
FAX: (928) 758-8654

| DESIGN: | SDF | SCALE | JOB NO. | DATE | SHEET |
|---|---|---|---|---|---|
| DRAWN: | RLM | HORZ. 1"=25' | 7958-02 | 6/8/16 | 16 OF 20 |
| CHECK: | RLM | VERT. N.T.S. | | | |

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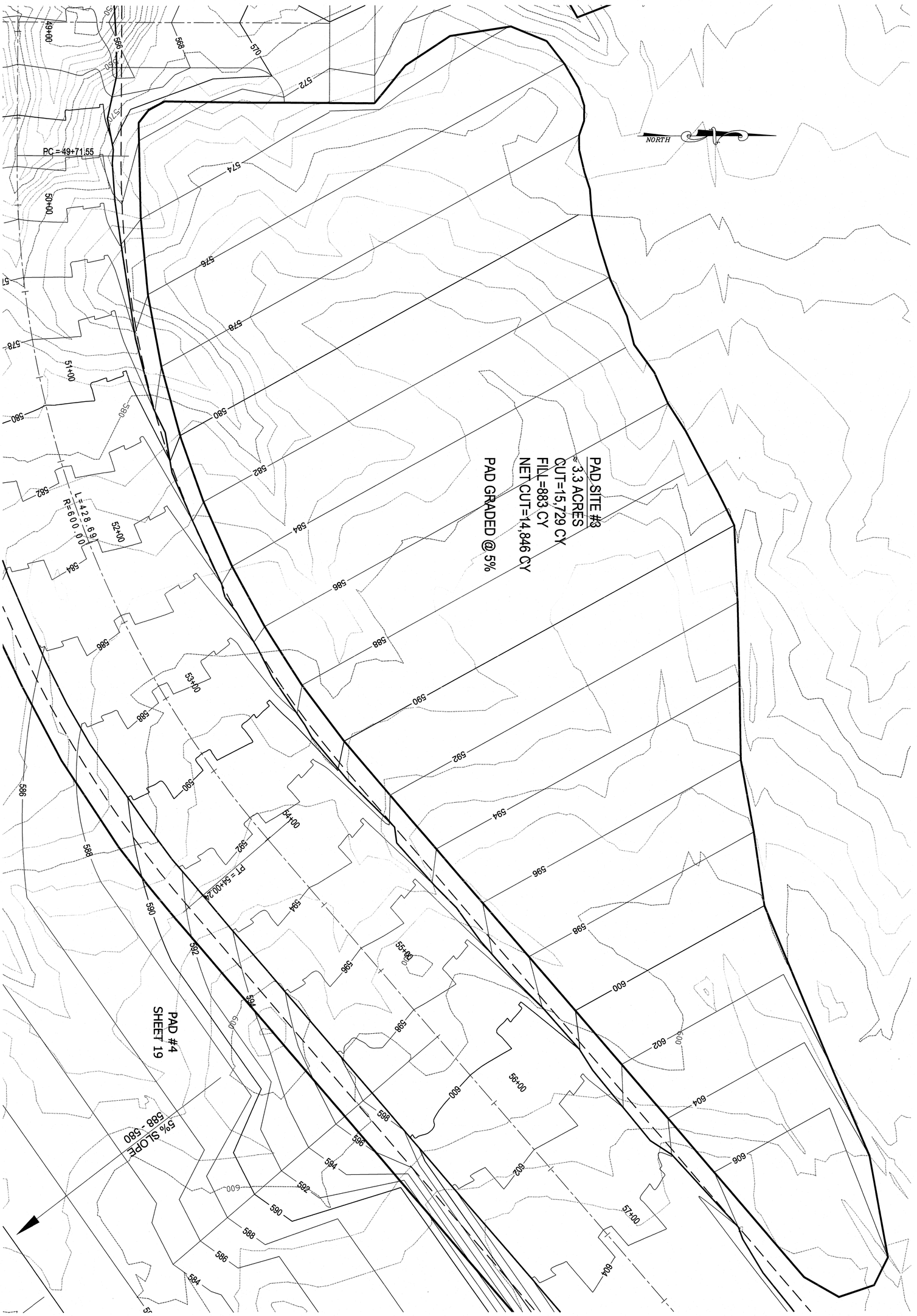
| REV. NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 1 | 6/3/16 | LHC 5/15/16 COMMENTS | SDF |

# HAVASU 280
# MARINA/RIVIERA ACCESS
# MULTI-USE PAD #2
# GRADING PLAN

REGISTERED PROFESSIONAL ENGINEER (CIVIL)
CERTIFICATE NO.
14395
R. LARRY MORSE
Date Signed 6-8-16
ARIZONA, U.S.A.
Expires 9/30/2018


ARQ ENGINEERING LLC
Engineering and Survey
4440 HIGHWAY 95, SUITE A
FORT MOHAVE, ARIZONA 86429
PHONE: (928) 758-3333
FAX: (928) 758-8654


| DESIGN: | SDF | SCALE | | JOB NO. | DATE | SHEET |
|---|---|---|---|---|---|---|
| DRAWN: | RLM | HORZ. | 1"=25' | 7958-02 | 6/8/16 | 17 OF 20 |
| CHECK: | RLM | VERT. | N.T.S. | | | |

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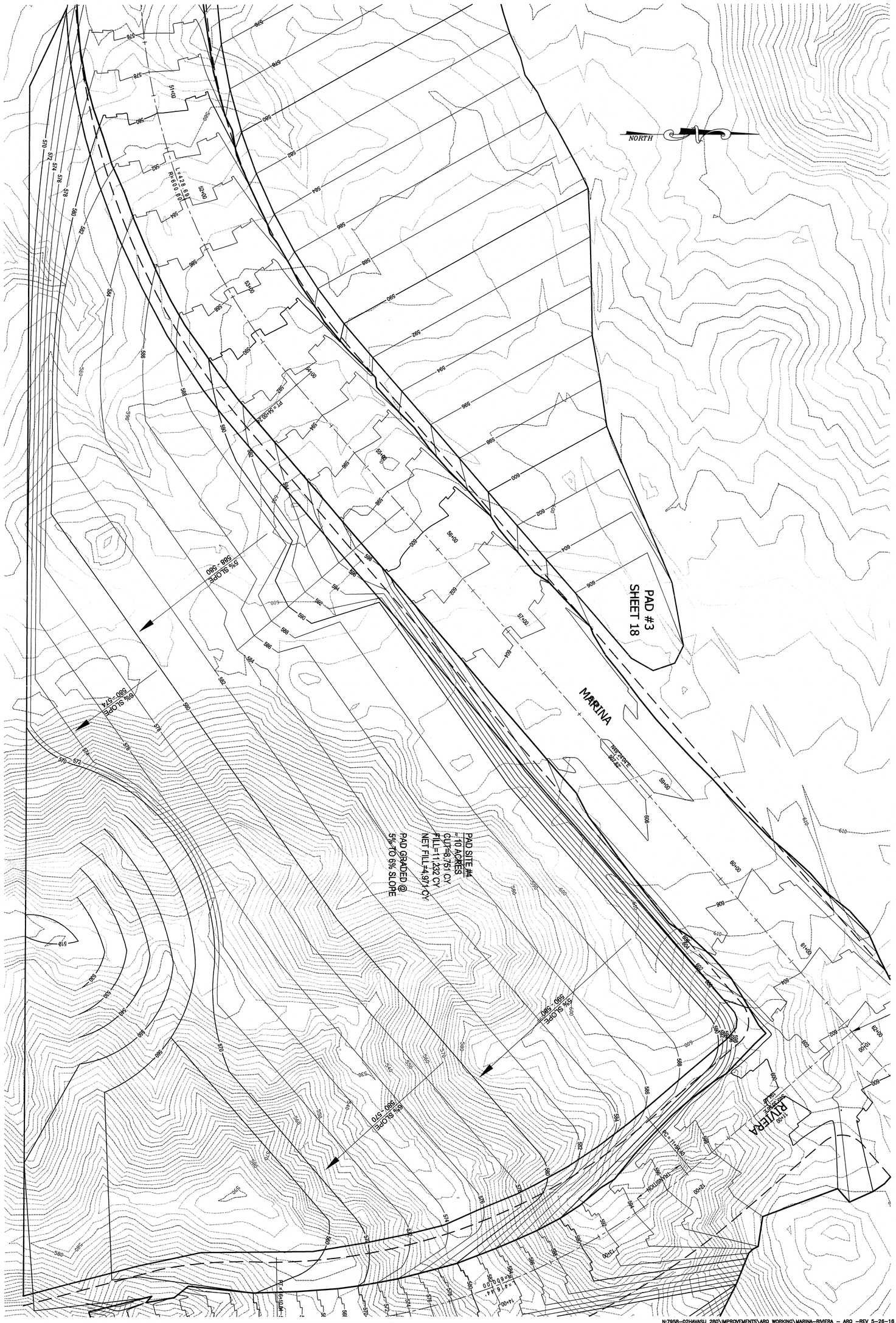
| REV. NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 1 | 6/3/16 | LHC 5/15/16 COMMENTS | SDF |

# HAVASU 280
# MARINA/RIVIERA ACCESS
# MULTI-USE PAD #3
# GRADING PLAN

REGISTERED PROFESSIONAL ENGINEER (CIVIL)
CERTIFICATE NO.
14395
R. LARRY MORSE
ARIZONA, U.S.A.
Expires 9/30/2018


ARQ ENGINEERING LLC
Engineering and Survey
4440 HIGHWAY 95, SUITE A
FORT MOHAVE, ARIZONA 86429
PHONE: (928) 758-3333
FAX: (928) 758-8654


| DESIGN: | SDF | SCALE | | JOB NO. | DATE | SHEET |
|---|---|---|---|---|---|---|
| DRAWN: | RLM | HORZ. | 1"=25' | 7958-02 | 6/8/16 | 18 OF 20 |
| CHECK: | RLM | VERT. | N.T.S. | | | |

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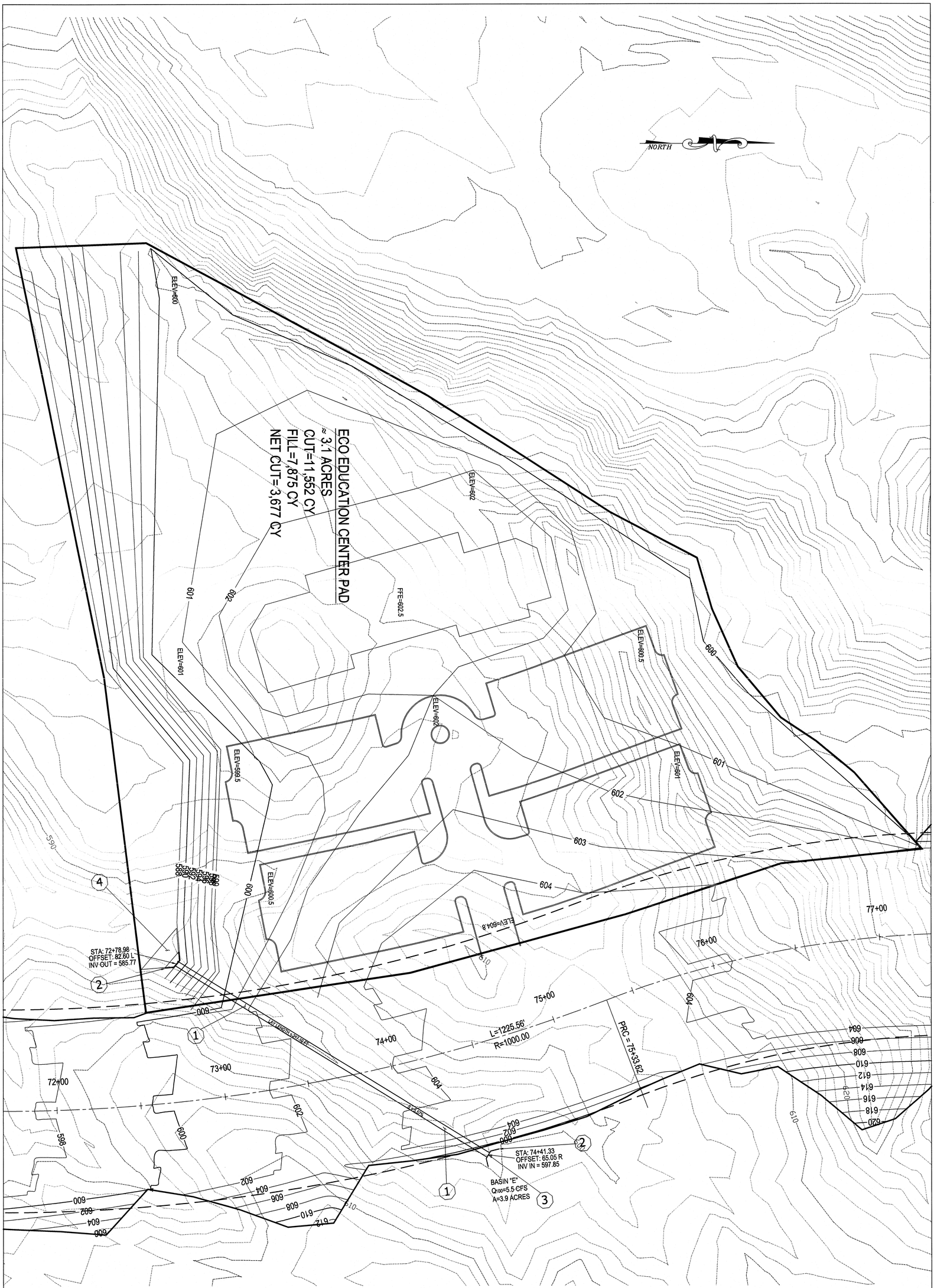
| REV. NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 1 | 6/3/16 | LHC 5/15/16 COMMENTS | SDF |

# HAVASU 280
# MARINA/RIVIERA ACCESS
# MULTI-USE PAD #4
# GRADING PLAN


ARQ ENGINEERING LLC
Engineering and Survey
4440 HIGHWAY 95, SUITE A
FORT MOHAVE, ARIZONA 86429
PHONE: (928) 758-3333
FAX: (928) 758-8654


| DESIGN: | SDF | SCALE | | JOB NO. | DATE | SHEET |
|---|---|---|---|---|---|---|
| DRAWN: | RLM | HORZ. | 1"=25' | 7958-02 | 6/8/16 | 19 OF 20 |
| CHECK: | RLM | VERT. | N.T.S. | | | |




N:\7958-02\HAVASU 280\IMPROVEMENTS\ARQ WORKING\MARINA-RIVIERA - ARQ -REV 5-26-16 PLANS

| REV. NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 1 | 6/3/16 | LHC 5/15/16 COMMENTS | SDF |

# HAVASU 280
# MARINA/RIVIERA ACCESS
# ECO-EDUCATIONAL CENTER PAD
# GRADING PLAN

REGISTERED ENGINEER
CERTIFICATE NO.
14395
R. LARRY MORSE
ARIZONA, U.S.A.
Expires 9/30/2018


ARQ ENGINEERING LLC
Engineering and Survey
4440 HIGHWAY 95, SUITE A
FORT MOHAVE, ARIZONA 86429
PHONE: (928) 758-3333
FAX: (928) 758-8654


| DESIGN: | SDF | SCALE | | JOB NO. | DATE | SHEET |
|---|---|---|---|---|---|---|
| DRAWN: | RLM | HORZ. | 1"=25' | 7958-02 | 6/8/16 | 20 OF 20 |
| CHECK: | RLM | VERT. | N.T.S. | | | |