

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGIONAL OFFICE VII
SIQUIJOR DISTRICT ENGINEERING OFFICE
Larena, Siquijor

C.Y. 2024 PROJECT
DETAILED ENGINEERING DESIGN PLAN FOR
**MOOE - MAINTENANCE, REPAIR AND REHABILITATION OF
INFRASTRUCTURE FACILITIES AND OTHER RELATED ACTIVITIES -
MAINTENANCE, REPAIR AND REHABILITATION OF INFRASTRUCTURE
FACILITIES - FLOOD CONTROL AND DRAINAGE SYSTEMS, STRUCTURES
AND RELATED FACILITIES, REPAIR/MAINTENANCE OF SEÑORA RIVER
REVTMENT 1, TIGBAWAN, LAZI, SIQUIJOR**
LAZI, SIQUIJOR
STA. 0+085.00 - STA. 0+095.00 (LEFT-SIDE)
NET LENGTH = 10.00 METERS

SUBMITTED:

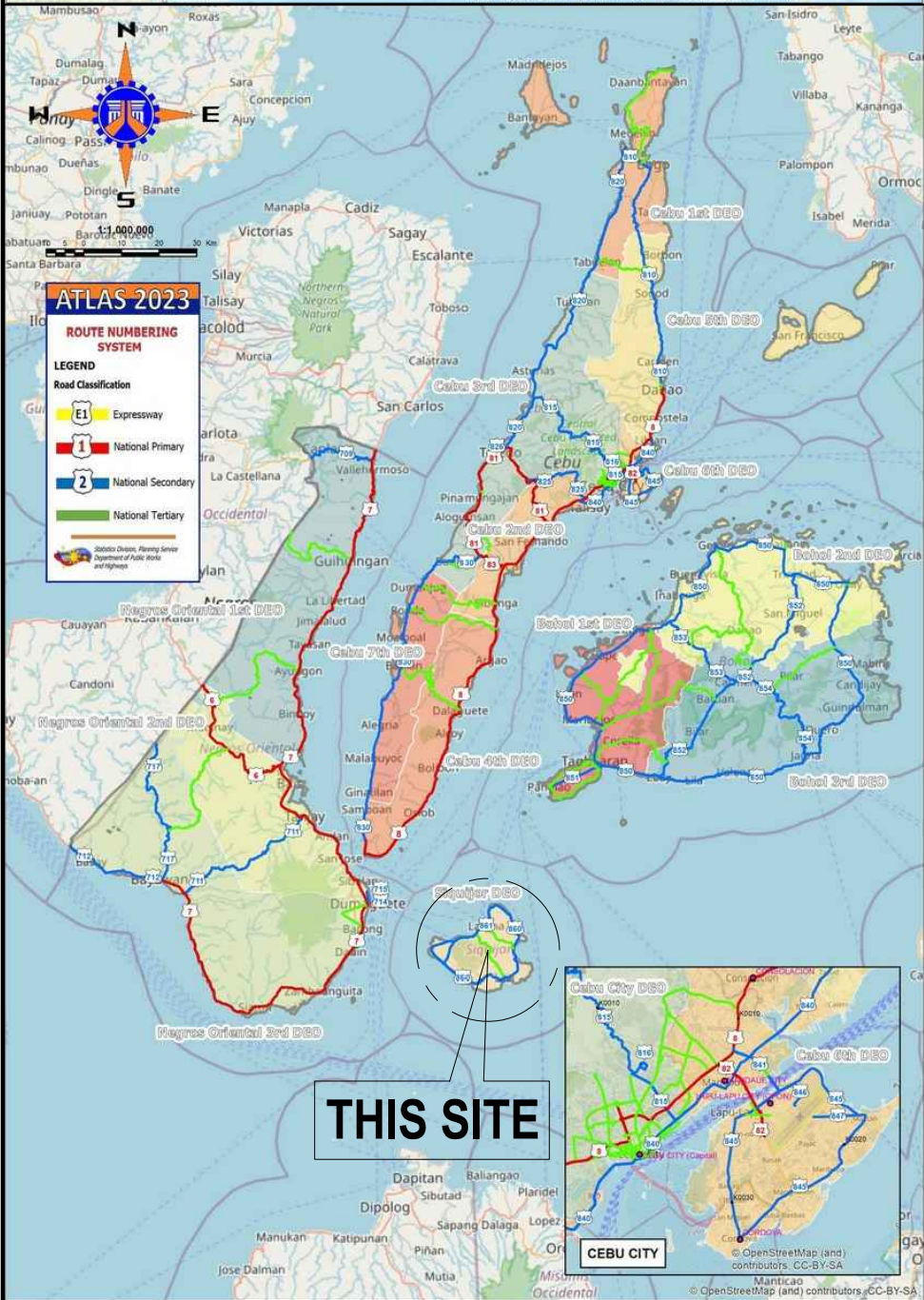
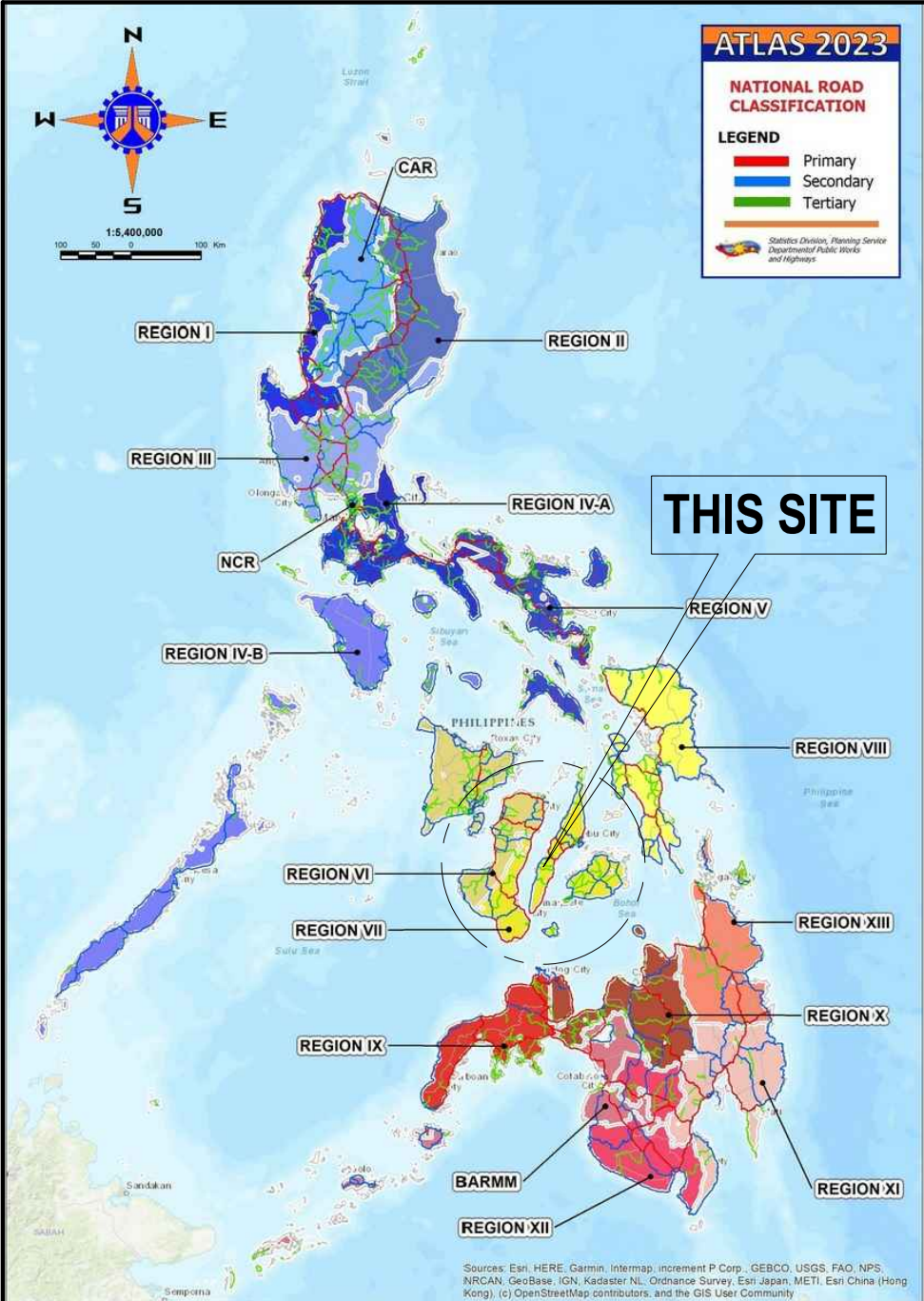
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APPROVED:

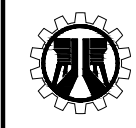
JAY VINCENT C. PAL-ING
CHIEF, MAINTENANCE SECTION
DATE:

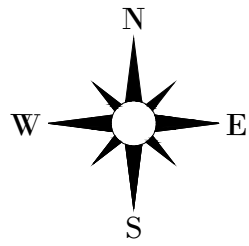
RAKIL-ALI S. RAK-IN, AER
ASSISTANT DISTRICT ENGINEER
DATE:

YUSOPH D. RASUMAN
DISTRICT ENGINEER
DATE:



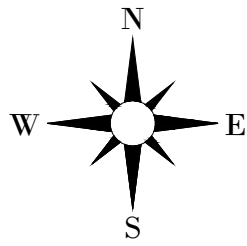
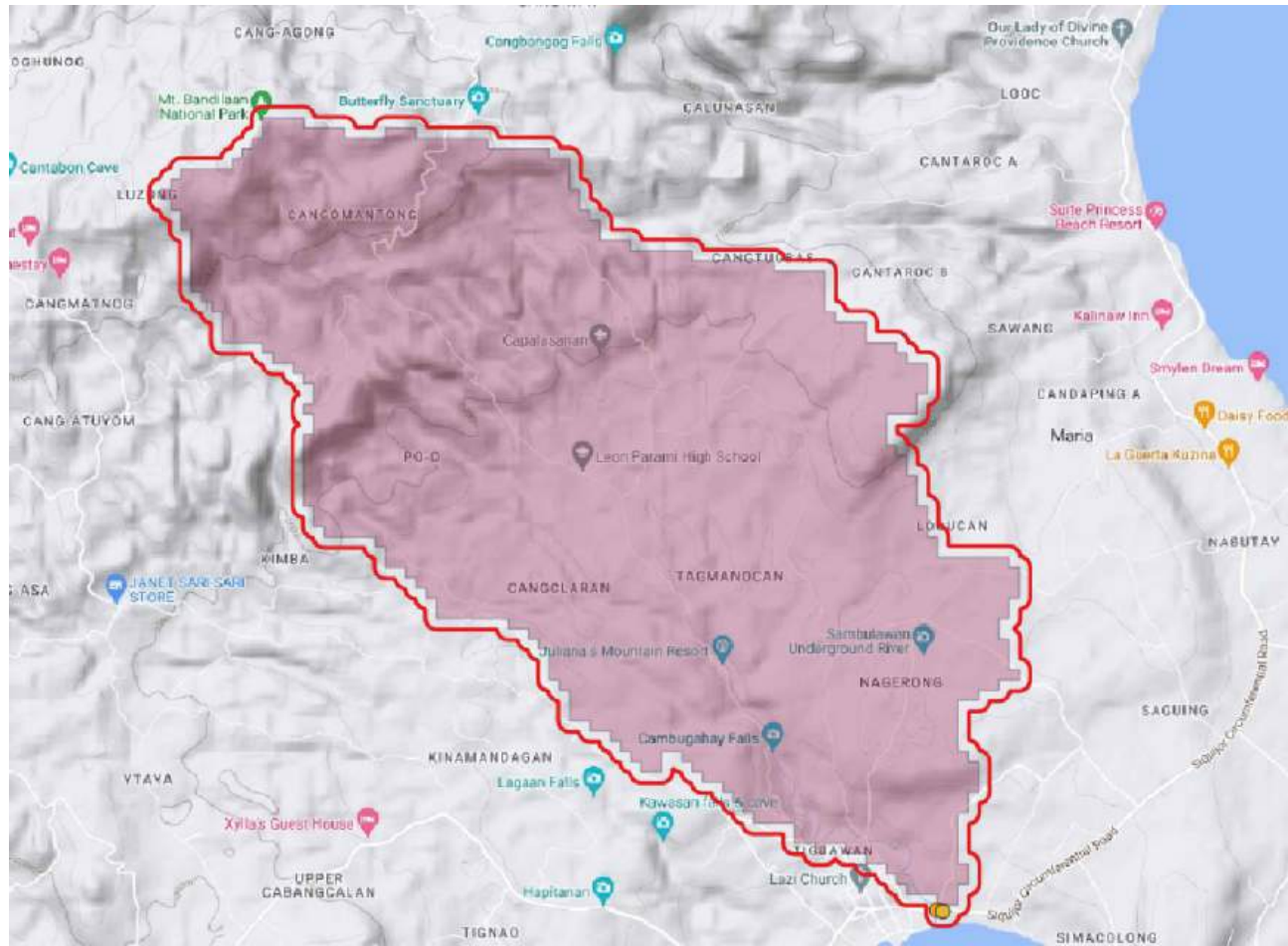
PROJECT LENGTH DATA		
LIMITS	LENGTH (m)	REMARKS
STA. 0+085.00 - STA. 0+095.00	10.00	CONCRETE REVETMENT WITH STEEL SHEET PILES FOUNDATION (LEFT-SIDE)
INDEX OF SHEETS		
SHEET NO.	SHEET CONTENTS	
1	COVER PAGE	
2	LOCATION MAP LOCATION PLAN PROJECT LENGTH DATA INDEX OF SHEETS	
3	VICINITY MAP TERRAIN MAP CATCHMENT AREA BASIN MAP	
4	GENERAL PLAN	
5	SUMMARY OF QUANTITIES	
6 ~ 8	GENERAL NOTES	
9	FLOOD CONTROL TYPICAL CROSS SECTION SECTION DETAIL	
10	PILE CAP DETAIL PARAPET DETAIL WALKWAY SLAB DETAIL BAR BENDING DIAGRAM	
11	PLAN AND PROFILE	
12	TOPOGRAPHIC PLAN	
13	DETAILED CROSS SECTIONS - FACING DOWNSTREAM	
14	DPWH STANDARD PROJECT BILLBOARD	

 <div>Republic of the Philippines DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGIONAL OFFICE VII SIQUIJOR DISTRICT ENGINEERING OFFICE Larena, Siquijor</div>	PROJECT NAME AND LOCATION: MOOE - MAINTENANCE, REPAIR AND REHABILITATION OF INFRASTRUCTURE FACILITIES AND OTHER RELATED ACTIVITIES - MAINTENANCE, REPAIR AND REHABILITATION OF INFRASTRUCTURE FACILITIES - FLOOD CONTROL AND DRAINAGE SYSTEMS, STRUCTURES AND RELATED FACILITIES, REPAIR/MAINTENANCE OF SEÑORA RIVER REVETMENT 1, TIGBAWAN, LAZI, SIQUIJOR	SHEET CONTENTS: LOCATION MAP VICINITY MAP PROJECT LENGTH DATA INDEX OF SHEETS CATCHMENT AREA	DRAFTED: XYRN A. DAVAL ENGINEER II	REVIEWED:	SUBMITTED:	RECOMMENDED:	APPROVED:	SET NO.	SHEET NO.
			PREPARED: ERNESTO S. REMOLLO, JR. ENGINEER II	BERNARD Z. DURAN ENGINEER II DATE:	JAY VINCENT C. PAL-ING CHIEF, MAINTENANCE SECTION DATE:	RAKIL-ALI S. RAKI-IN, AER ASSISTANT DISTRICT ENGINEER DATE:	YUSOPH D. RASUMAN DISTRICT ENGINEER DATE:	1 1	2 14



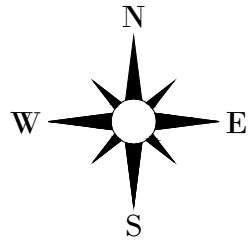
VICINITY MAP

SCALE NOT TO SCALE



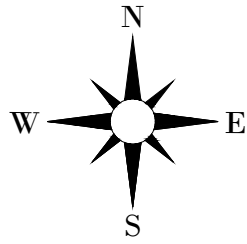
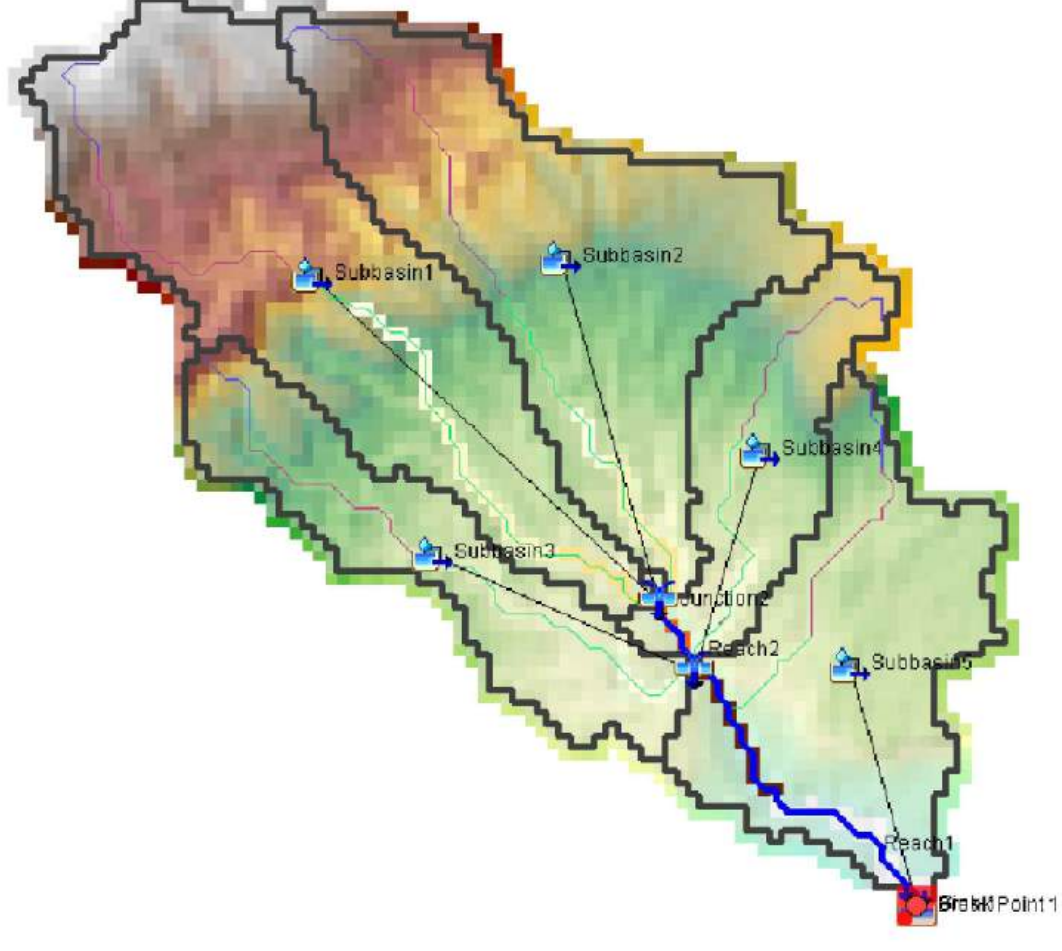
CATCHMENT AREA

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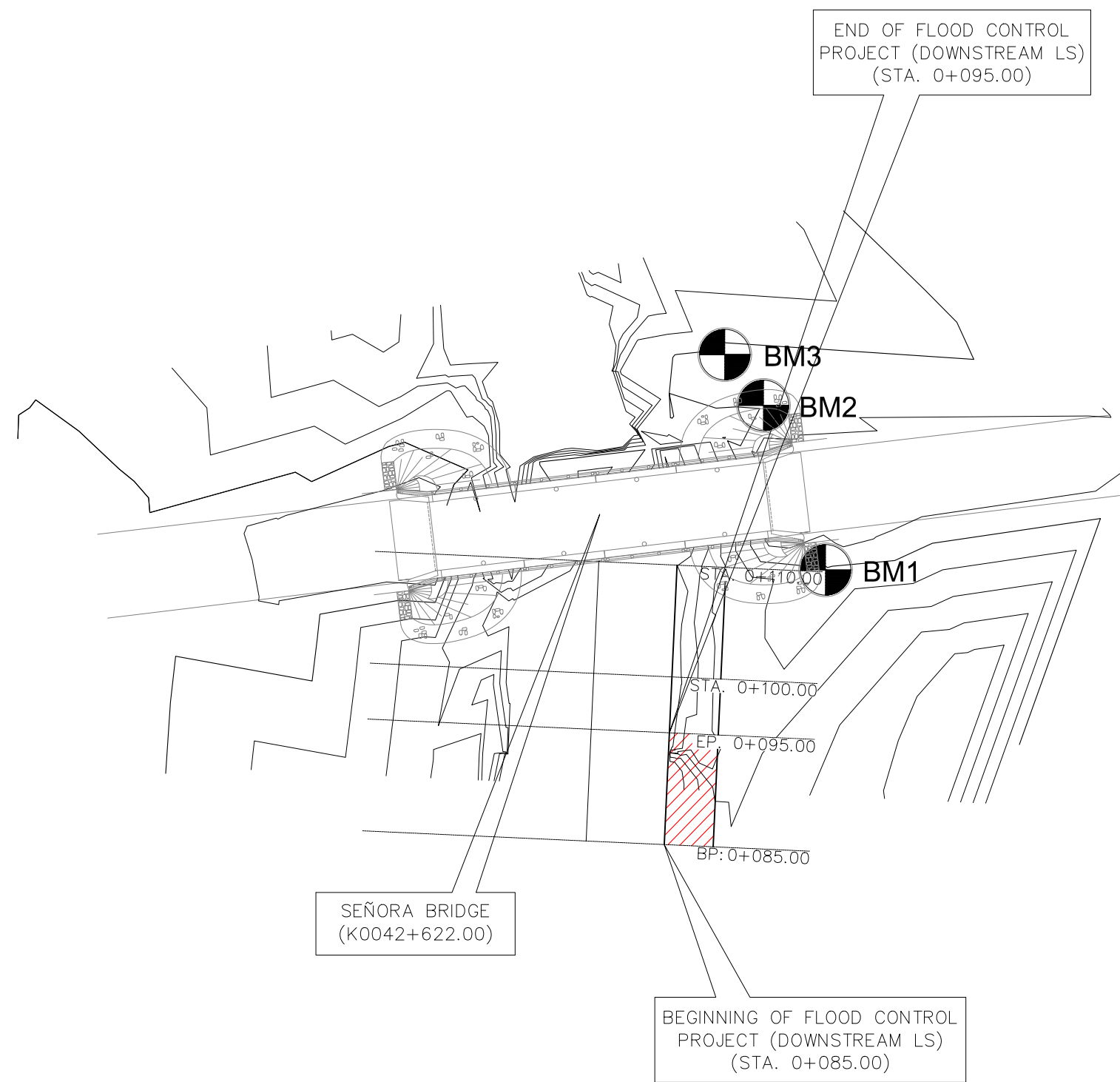
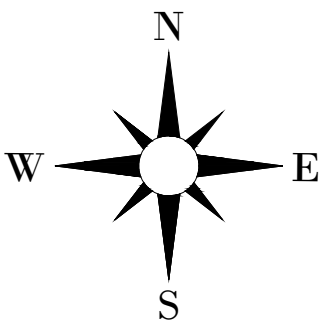
TERRAIN MAP

SCALE NOT TO SCALE




BASIN MAP

SCALE NOT TO SCALE



GENERAL PLAN
SCALE NOT TO SCALE

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SUMMARY OF QUANTITIES				
ITEM NO.	DESCRIPTION	ORIGINAL QUANTITY	UNIT	REMARKS
A.1.1(8)	PROVISION OF FIELD OFFICE FOR THE ENGINEER (RENTAL BASIS)	2.00	MONTH	
A.1.1(16)	OPERATION & MAINTENANCE OF FIELD OFFICE FOR THE ENGINEER	2.00	MONTH	
B.5(1)	PROJECT BILLBOARD / SIGNBOARD	2.00	EACH	
B.7(1)	OCCUPATIONAL SAFETY AND HEALTH	1.00	LUMP SUM	
B.9(1)	MOBILIZATION / DEMOBILIZATION	1.00	LUMP SUM	
1700(2)	CLEARING AND GRUBBING	1.00	LUMP SUM	
1710(1)a	RIPRAP (CLASS A)	12.73	CUBIC METER	
1711(1)	STONE MASONRY	1.80	CUBIC METER	
1712(1)	CONCRETE SLOPE PROTECTION	14.05	CUBIC METER	
1717(3)b	FURNISHING OF STEEL SHEET PILE (Z-TYPE, GRADE 50)	8,201.70	KILOGRAM	STEEL SHEET PILES HOT ROLLED Z TYPE FY50 MHZ13-820 820mm x 380mm x 7.8/7.7mm (w = 70.10 kg/m)
1717(8)b	STEEL SHEET PILE, DRIVEN (Z-TYPE, GRADE 50)	78.00	METER	



- 1.1 SURVEY CONTROLS AND REFERENCES
 - 1.1.1 SURVEY CONTROLS AND REFERENCES ARE PROVIDED IN THE TOPOGRAPHIC REPORT AND IN THE DRAWINGS, SEE TOPOGRAPHIC PLAN.
- 1.2 STATIONINGS
 - 1.2.1 CENTERLINE STATIONING OF THE PROJECT WERE BASED FROM THE BRIDGE OF THE RIVER.
 - 1.2.2 ALIGNMENT AND GRADE ARE SUBJECT TO ADJUSTMENT TO SUIT EXISTING FIELD CONDITIONS.
- 1.3 ELEVATION AND GRADE
 - 1.3.1 ELEVATIONS AND GRADES AS DESCRIBED IN THE PROFILE ARE CENTER OF THE EXISTING RIVER BED, BANK ELEVATION, BOTTOM OF PILE CAP, ORDINARY WATER LEVEL, MAXIMUM EXPERIENCE FLOOD LEVEL, DESIGN FLOOD LEVEL, DESIGN RIVER BED AND TOP ELEVATION OF FLOOD CONTROL STRUCTURES.
- 1.4 HORIZONTAL CONTROL
 - 1.4.1 BASIC TRAVERSE STATIONS WERE ESTABLISHED BASED ON STATIONS OF EXISTING KM. POSTS AND EXISTING PERMANENT STRUCTURES AT THE PROJECT SITE.
- 1.5 VERTICAL CONTROL
 - 1.5.1 ELEVATIONS WERE ASSUMED AT THE FIRST BENCH MARK AT THE BEGINING OF EACH SECTION OF THE PROJECT.
 - 1.5.2 BENCH MARKS WERE ESTABLISHED AT EXISTING UNDISTURBED STRUCTURES AT DIFFERENT INTERVALS ALONG THE PROJECT.
- 1.6 DIMENSIONS
 - 1.6.1 DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
 - 1.6.2 STATIONING ARE GIVEN IN KILOMETERS AND METERS.
 - 1.6.3 RADI TRANSITION CURVES ELEVATIONS AND FLOOR LEVELS ARE GIVEN IN METERS.

2.1	DESIGN STRESSES	
2.1.1	CONCRETE FOR SLOPE PROTECTION, CLASS "A" COMPRESSIVE STRENGTH @28 DAYS,	$f_c' = 20.70 \text{ MPa}$
2.1.2	STRUCTURAL STEEL, ASTM-A36 STEEL SHEET PILES,	$f_y = 248.30 \text{ MPa}$
2.1.3	REINFORCING STEEL GRADE 40 STRUCTURAL GRADE DEFORMED BARS,	$f_y = 275.00 \text{ MPa}$
2.1.4	WELDS - USED E-60XX ELECTRODE	
2.2	DESIGN LOADINGS	
2.2.1	REINFORCED CONCRETE	$\delta c' = 23.56 \text{ kN/m}^3$
2.2.2	RIPRAP, LIMESTONE	$\delta c' = 13.00 \text{ kN/m}^3$

HYDROLOGIC ANALYSIS								
25 YEAR RETURN PERIOD			50 YEAR RETURN PERIOD			100 YEAR RETURN PERIOD		
	QTY	UNIT		QTY	UNIT		QTY	UNIT
CATCHMENT AREA	28.174	SQ.KM.	CATCHMENT AREA	28.174	SQ.KM.	CATCHMENT AREA	28.174	SQ.KM.
DISCHARGE (D)	182.60	M ³ /SEC	DISCHARGE (D)	208.70	M ³ /SEC	DISCHARGE (D)	234.50	M ³ /SEC
VELOCITY (V)		M/SEC	VELOCITY (V)		M/SEC	VELOCITY (V)		M/SEC

4.1 RIPRAP AND GROUTED RIPRAP

4.1.1 STONES

STONES FOR RIPRAP SHALL CONSIST OF ROCK AS NEARLY AS RECTANGULAR IN SECTION AS IS PRACTICAL, EXCEPT THAT RIPRAP OF CLASS A MAY CONSIST OF ROUND NATURAL STONES. THE STONES

STONES FOR RIPRAP SHALL CONSIST OF ROCK AS NEARLY AS RECTANGULAR IN SECTION AS IS PRACTICAL, EXCEPT THAT RIPRAP OF CLASS A MAY CONSIST OF ROUND NATURAL STONES. THE STONES SHALL BE SOUND, TOUGH, DURABLE, DENSE, RESISTANT TO THE ACTION OF AIR AND WATER, AND SUITABLE IN ALL RESPECTS FOR THE PURPOSE INTENDED.

STONES FOR RIPRAP SHALL BE ONE OF THE FOLLOWING CLASSES AS SHOWN ON THE PLANS OR DETERMINED BY THE ENGINEER.

WHEN REQUIRED, THE RIPRAP SHALL BE PLACED ON A FILTER LAYER TO PREVENT FINE EMBANKMENT MATERIALS TO BE WASHED OUT THROUGH THE VOIDS OF THE FACE STONES. THE GRADING OF THE FILTER MATERIAL SHALL BE AS SPECIFIED ON THE PLANS, OR IN THE SPECIAL PROVISIONS. IF NOT SO SPECIFIED, IT WILL BE REQUIRED THAT D15 OF THE FILTER IS AT LEAST 4 TIMES THE SIZE D85 FOR THE EMBANKMENT MATERIAL, WHERE D15 PERCENT AND 85 PERCENT, RESPECTIVELY, PASSING (BY MASS) IN A GRAIN SIZE ANALYSIS. FINE AGGREGATE PASSING GRADING REQUIREMENTS FOR ITEM 405, STRUCTURAL CONCRETE, WILL SATISFY FOREGOING REQUIREMENTS.

MORTAR FOR GROUTED RIPRAP SHALL CONSIST OF SAND, CEMENT AND WATER CONFORMING TO THE REQUIREMENTS GIVEN UNDER ITEM 405, STRUCTURAL CONCRETE, MIXED IN THE PROPORTION OF ONE PART CEMENT TO THREE PARTS SAND BY VOLUME, AND SUFFICIENT WATER TO OBTAIN THE REQUIRED CONSISTENCY.

THE HORIZONTAL AND VERTICAL CONTACT SURFACE BETWEEN STONES SHALL BE EMBEDDED BY CEMENT MORTAR HAVING A MINIMUM THICKNESS OF 20 MM. SUFFICIENT MORTAR SHALL BE USED TO COMPLETELY FILL ALL VOIDS LEAVING THE FACE OF THE STONES EXPOSED.

4.2.1 STONE

THE STONE SHALL BE CLEAN, HARD, AND DURABLE AND SHALL BE SUBJECT TO THE ENGINEER'S APPROVAL. ADOBE STONE SHALL NOT BE USED UNLESS OTHERWISE SPECIFIED.

STONES HAVE A THICKNESS OF NOT LESS THAN 150 MM, AND WIDTHS OF NOT LESS THAN ONE AND ONE-HALF TIMES THEIR RESPECTIVE THICKNESS, AND LENGTHS OF NOT LESS THAN ONE AND ONE HALF TIMES THEIR RESPECTIVE WIDTHS. EACH STONE SHALL BE OF GOOD SHAPE AND BE FREE OF DEPRESSIONS AND PROJECTIONS THAT MIGHT WEAKEN OR PREVENT IT FROM BEING PROPERLY BEDDED.

DRESSING - THE STONE SHALL BE DRESSED TO REMOVE ANY THIN OR WEAK PORTIONS. FACE STONES SHALL BE DRESSED TO PROVIDE BED AND JOINT LINES THAT DO NOT VARY MORE THAN 20 MM FROM THE TRUE LINES AND TO ENSURE THE MEETING OF BED AND JOINT LINES WITHOUT THE ROUNDING OF CORNERS OF THE STONES IN EXCESS OF 30 MM IN RADIUS. BED SURFACES OF THE FACE STONES SHALL BE APPROXIMATELY NORMAL TO THE FACE OF THE STONES FOR ABOUT 80 MM AND FROM THIS POINT MAY DEPART FROM A NORMAL PLANE NOT TO EXCEED 50 MM IN 300 MM.

FINISH FOR EXPOSED FACES - FACE STONES SHALL BE PITCHED TO THE LINE ALONG THE BEDS AND JOINTS. THE MAXIMUM PROJECTION OF ROCK FACES BEYOND PITCH LINES SHALL NOT BE MORE THAN 50 MM.

CEMENT, FINE AGGREGATE, AND WATER SHALL CONFORM TO THE RESPECTIVE REQUIREMENTS FOR THOSE MATERIALS AS SPECIFIED UNDER ITEM 405, STRUCTURAL CONCRETE, EXCEPT AS TO THE GRADING OF FINE AGGREGATE WHICH SHALL ALL PASS THE 2.36 MM (NO. 8) SIEVE, NOT LESS THAN 15 NOR MORE THAN 40 PERCENT SHALL PASS THE 0.3 MM (NO. 50) SIEVE, AND NOT MORE THAN 10 PERCENT SHALL PASS THE 0.15 MM (NO.100) SIEVE.

THE MORTAR FOR THE MASONRY SHALL BE COMPOSED OF ONE PART OF PORTLAND CEMENT AND TWO PARTS OF FINE AGGREGATE BY VOLUME AND SUFFICIENT WATER TO MAKE THE MORTAR OF SUCH CONSISTENCY THAT IT CAN BE HANDLED EASILY AND SPREAD WITH A TROWEL. MORTAR SHALL BE MIXED ONLY IN THOSE QUANTITIES REQUIRED FOR IMMEDIATE USE, UNLESS AN APPROVED MORTAR MIXING MACHINE IS USED, THE FINE AGGREGATE AND CEMENT SHALL BE MIXED DRY IN A TIGHT BOX UNTIL THE MIXTURE ASSUMES A UNIFORM COLOR, AFTER WHICH, WATER SHALL BE ADDED AS THE MIXING CONTINUES UNTIL THE MORTAR ATTAINS THE PROPER CONSISTENCY. MORTAR THAT IS NOT USED WITHIN 90 MINUTES AFTER THE WATER HAS BEEN ADDED SHALL BE DISCARDED. RETEMPERING OF MORTAR WILL NOT BE PERMITTED.

4.3.1 BED COURSE

A BED COURSE, WHERE REQUIRED, SHALL BE GRANULAR MATERIAL WHICH SATISFIES THE REQUIREMENTS FOR ITEM 200, AGGREGATE SUB-BASE, GRADING A.

FORMWORK, WHERE NECESSARY, SHALL BE AS SPECIFIED IN ITEM 407, CONCRETE STRUCTURES.

STEEL REINFORCEMENT SHALL BE AS SPECIFIED IN ITEM 404,
REINFORCING STEEL.

CONCRETE SHALL BE CLASS B AS SPECIFIED IN ITEM 405, STRUCTURAL CONCRETE, UNLESS OTHERWISE SPECIFIED OR REQUIRED BY THE ENGINEER.

STEEL SHEET PILES SHALL BE OF THE TYPE, WEIGHT AND SECTION MODULUS INDICATED ON THE PLANS OR SPECIAL PROVISIONS, AND SHALL MEET THE REQUIREMENTS OF AASHTO M202 (ASTM A-328), OR AASHTO M223. ALL OTHER SHEET PILES SHALL MEET THE REQUIREMENTS PRESCRIBED ABOVE THE PARTICULAR MATERIAL SPECIFIED. THE JOINTS SHALL BE PRACTICALLY WATER-TIGHT WHEN THE PILES ARE IN PLACE. PILE SHOES SHALL BE CALLED FOR ON THE PLANS. MATERIAL FOR PILE SPLICES, WHEN SPLICING IS ALLOWED, SHALL BE OF THE SAME QUALITY AS THE MATERIAL USED FOR THE PILE ITSELF AND SHALL FOLLOW THE REQUIREMENTS GIVEN ON THE PLANS.

5.1 CLEARING AND GRUBBING

5.1.1 GENERAL

THE ENGINEER WILL ESTABLISH THE LIMITS OF WORK AND DESIGNATE ALL TREES, SHRUBS, PLANTS AND OTHER THINGS TO REMAIN. THE CONTRACTOR SHALL PRESERVE ALL OBJECTS DESIGNATED TO REMAIN. PAINT REQUIRED FOR CUT OR SCARRED SURFACE OF TREES OR SHRUBS SELECTED FOR RETENTION SHALL BE AN APPROVED ASPHALTUM BASE PAINT PREPARED ESPECIALLY FOR TREE SURGERY.

CLEARING SHALL EXTEND ONE (1) METER BEYOND THE TOE OF THE FILL SLOPES OR BEYOND ROUNDING OF CUT SLOPES AS THE CASE MAYBE FOR THE ENTIRE LENGTH OF THE PROJECT UNLESS OTHERWISE SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER AND PROVIDED IT IS WITHIN THE RIGHT OF WAY LIMITS OF THE PROJECT, WITH THE EXCEPTION OF TREES UNDER THE JURISDICTION OF THE FOREST MANAGEMENT BUREAU (FMB).

ALL SURFACE OBJECTS AND ALL TREES, STUMPS, ROOTS AND OTHER PROTRUDING OBSTRUCTIONS, NOT DESIGNATED TO REMAIN, SHALL BE CLEARED AND/OR GRUBBED, INCLUDING MOWING AS REQUIRED, EXCEPT AS PROVIDED BELOW: (1) REMOVAL OF UNDISTURBED STUMPS AND ROOTS AND NONPERISHABLE SOLID OBJECTS WITH A MINIMUM DEPTH OF ONE


- (1) METER BELOW SUBGRADE OR SLOPE OF EMBANKMENT WILL NOT BE REQUIRED.
- (2) IN AREAS OUTSIDE OF THE GRADING LIMITS OF CUT AND EMBANKMENT AREAS, STUMPS AND NONPERISHABLE SOLID OBJECTS SHALL BE CUT OFF NOT MORE THAN 150 MM (6 INCHES) ABOVE THE GROUND LINE OR LOW WATER LEVEL.
- (3) IN AREAS TO BE ROUNDED AT THE TOP OF CUT SLOPES, STUMPS SHALL BE CUT OFF FLUSH WITH OR BELOW THE SURFACE OF THE FINAL SLOPE LINE.
- (4) GRUBBING OF PITS, CHANNEL CHANGES AND DITCHES WILL BE REQUIRED ONLY TO THE DEPTH NECESSITATED BY THE PROPOSED EXCAVATION WITHIN SUCH AREAS.
- (5) IN AREAS COVERED BY COGON/TALAHIB, WILD GRASS AND OTHER VEGETATIONS, TOP SOIL SHALL BE CUT TO A MAXIMUM DEPTH OF 150 MM BELOW THE ORIGINAL GROUND SURFACE OR AS DESIGNATED BY THE ENGINEER, AND DISPOSED OUTSIDE THE CLEARING AND GRUBBING LIMITS AS INDICATED IN THE TYPICAL ROADWAY SECTION.

EXCEPT IN AREAS TO BE EXCAVATED, STUMP HOLES AND OTHER HOLES FROM WHICH OBSTRUCTIONS ARE REMOVED SHALL BE BACKFILLED WITH SUITABLE MATERIAL AND COMPACTED TO THE REQUIRED DENSITY.

IF PERISHABLE MATERIAL IS BURNED, IT SHALL BE BURNED UNDER THE CONSTANT CARE OF COMPONENT WATCHMEN AT SUCH TIMES AND IN SUCH A MANNER THAT THE SURROUNDING VEGETATION, OTHER ADJACENT PROPERTY, OR ANYTHING DESIGNATED TO REMAIN ON THE RIGHT OF WAY WILL NOT BE JEOPARDIZED. IF PERMITTED, BURNING SHALL BE DONE IN ACCORDANCE WITH APPLICABLE LAWS, ORDINANCES, AND REGULATION.

THE CONTRACTOR SHALL USE HIGH INTENSITY BURNING PROCEDURES, (I.E., INCINERATORS, HIGH STACKING OR PIT AND DITCH BURNING WITH FORCED AIR SUPPLEMENTS) THAT PRODUCE INTENSE BURNING WITH LITTLE OR NO VISIBLE SMOKE EMISSION DURING THE BURNING PROCESS. AT THE CONCLUSION OF EACH BURNING SESSION, THE FIRE SHALL BE COMPLETELY EXTINGUISHED SO THAT NO SMOLDERING DEBRIS REMAINS.

IN THE EVENT THAT THE CONTRACTOR IS DIRECTED BY THE ENGINEER NOT TO START BURNING OPERATIONS OR TO SUSPEND SUCH OPERATIONS BECAUSE OF HAZARDOUS WEATHER CONDITIONS,

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