



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

REGIONAL OFFICE NO. 3

SINDALAN, CITY OF SAN FERNANDO, (P)

C.Y. 2024 PROJECT
DETAIL ENGINEERING DESIGN PLAN FOR

STATE UNIVERSITIES AND COLLEGES (SUCs)
REPAIR AND REHABILITATION OF ROAD NETWORKS WITH PROVISION
OF WALKABLE PEDESTRIAN PATHWAYS FOR EMPLOYEES AND
STUDENTS AND THOSE WITH SPECIAL NEEDS (PHASE 1)
TARLAC AGRICULTURAL UNIVERSITY
PROVINCE OF TARLAC

STA. 0 + 000.00 TO 0 + 381.99 = 381.99 L.M. (SECTION 1)
STA. 0 + 000.00 TO 0 + 200.53 = 200.53 L.M. (SECTION 2)
STA. 0 + 000.00 TO 0 + 069.00 = 69.00 L.M. (SECTION 3)

LENGTH = 651.52 L.M.

SUBMITTED :

ARTHUR Q. SANTOS
CHIEF, PLANNING AND DESIGN DIVISION

DATE: 07 OCT 2024

RECOMMENDED :

MELQUIADES H. STO. DOMINGO
ASSISTANT REGIONAL DIRECTOR

DATE: 07 OCT 2024

APPROVED :

ROSELLER A. TOLENTINO
REGIONAL DIRECTOR

DATE: 08 OCT 2024

CONCURRED :

SILVERIO RAMON C. SALUNSON, DBA
UNIVERSITY PRESIDENT
TARLAC AGRICULTURAL UNIVERSITY

DATE: 08 OCT 2024

SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	QUANTITIES	REMARKS
ROADWAY IMPROVEMENT				
101(3)b2	Removal of Actual Structures/Obstruction, 0.20m thick, PCCP (Unreinforced)	sq.m.	3,203.00	To be disposed
101(3)d	Removal of Actual Structures/Obstruction, 0.10m thick, Sidewalk	sq.m.	339.00	To be disposed
101(4)a1	Removal of Actual Structures/Obstruction, 610 mm dia., RCPC	l.m.	16.00	To be disposed
101(6)	Removal of Structures and Obstruction, Concrete	cu.m.	25.00	To be disposed
102(2)	Surplus Common Excavation	cu.m.	1,073.00	To be disposed
104(1)a	Embankment from roadway/structure excavation, Common Soil	cu.m.	306.00	compacted volume
105(1)a	Subgrade Preparation, Common Material	sq.m.	5,222.00	w=variable
200(1)	Aggregate Subbase Course	cu.m.	1,091.00	compacted volume
311(1)c1	Portland Cement Concrete Pavement (Unreinforced), 0.23m thk, 1	sq.m.	3,640.00	w=6.00m, w=5.00m
404(1)a	Reinforcing Steel, Grade 40	kg.	4,411.00	lined canal and headwall
405(1)a3	Structural Concrete, 20.68 Mpa, Class A, 28 days	cu.m.	50.00	lined canal and headwall
500(1)a1	Pipe Culverts, 610 mm dia., Class II, RCPC	l.m.	260.00	
500(1)a3	Pipe Culverts, 910 mm dia., Class II, RCPC	l.m.	16.00	cross drain
502(1)a3	Manholes, 910 mm dia., Concrete	ea.	2.00	
505(2)a	Grouted Riprap, Class A	cu.m.	146.00	
506(1)	Stone Masonry	cu.m.	39.00	
600(4)	Curb and Gutter, Cast in place	l.m.	520.00	
601(1)	Sidewalk, 100 mm thk.	sq.m.	650.00	pathwalk and bike lane
612(1)	Reflectorized Thermoplastic Pavement Markings White	sq.m.	152.00	Centerline, Borderline, Bike, and arrow
624(15)	Single Arm, 6m-Pole Solar LED Roadway Lighting, 60W-80W	ea.	18.00	
DIVISION I - GENERAL				
803(1)a	Structure Excavation, Common Soil	cu.m.	500.26	
804(1)a	Embankment from roadway/structure excavation, Common Soil	cu.m.	449.14	
804(2)a	Embankment from Borrow, Common Soil	cu.m.	31.20	
804(7)	Gravel Fill	cu.m.	9.50	
900(1)c	Structural Concrete, 3000 psi, Class A, 28 days	cu.m.	45.92	
902(1)a1	Reinforcing Steel (Deformed), Grade 40	kg.	2,776.70	
902(1)a2	Reinforcing Steel (Deformed), Grade 60	kg.	1,068.12	
903(2)	Formworks and Falseworks	sq.m.	206.04	
DIVISION II - BUILDINGS				
1013(2)b	Fabricated Metal Roofing Accessory Gauge 26 (0.551 mm) Flashi	l.m.	729.00	
1014(1)b2	Pre-painted Metal Sheets, above 0.427 mm, Rib Type, Long Span	sq.m.	905.00	
1032(1)a	Painting Works, Masonry/Concrete	sq.m.	98.10	
1032(1)c	Painting Works, Steel	sq.m.	1,264.57	
1038(1)	Reflective Insulation	sq.m.	905.00	
1046(2)a1	CHB Non-Load Bearing (including Reinforcing Steel), 100 mm	sq.m.	312.00	
1047(5)a	Metal Structure Accessories, Bolts and Rods	kg.	206.45	
1047(5)b	Metal Structure Accessories, Sagrods	kg.	967.72	
1047(5)d	Metal Structure Accessories, Steel Plates	kg.	1,771.78	
1047(8)b	Structural Steel, Purlins	kg.	4,108.70	
1051(1)a	Railing	l.s.	1.00	



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SUMMARY OF QUANTITIES

PREPARED & ENCODED:
JULIE ANN S. DAVID
ENGINEER II

REVIEWED:
CARINA R. GAZO
CHIEF, BRIDGE & OTHER PUBLIC WORKS
DESIGN SECTION
DATE:

SUBMITTED:
ARTHUR D. SANTOS
CHIEF, PLANNING AND DESIGN DIVISION
DATE:

RECOMMENDED:
MELQUADES H. STO. DOMINGO
ASSISTANT REGIONAL DIRECTOR
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SET NO. SHEET NO.
TARLAC 3
2024 35

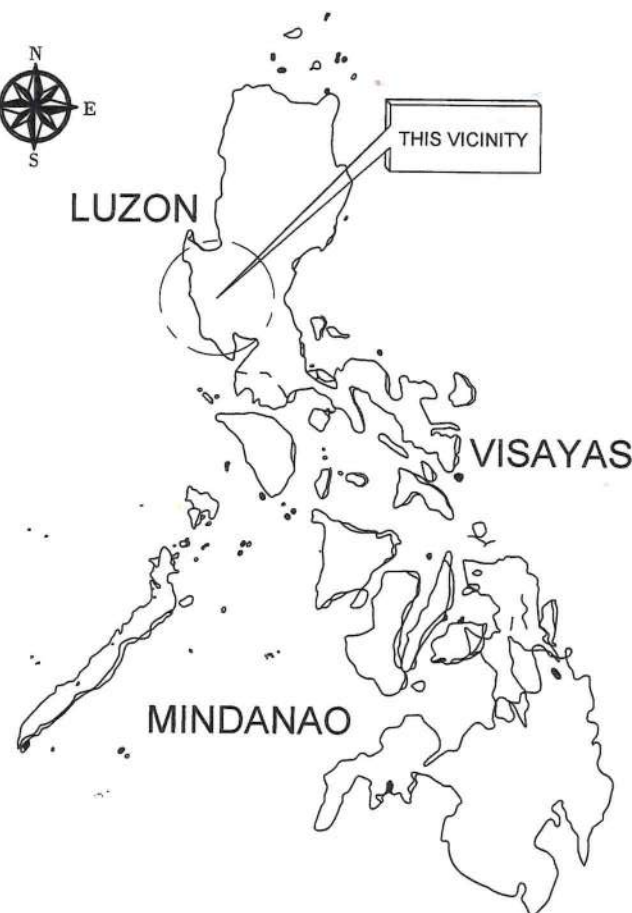
SPECIFICATIONS

SPECIFICATIONS FOR HIGHWAYS, BRIDGES, &
AIRPORTS, 2013 EDITION VOLUME II.

SPECIAL PROVISIONS & SUPPLEMENTAL
SPECIFICATIONS.

INDEX OF SHEETS :

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SHEET NO. 2	GENERAL NOTES AND DESIGN PARAMETERS
SHEET NO. 3	SUMMARY OF QUANTITIES
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SHEET NO. 5	TYPICAL ROADWAY SECTIONS
SHEET NO. 6 - 7	DETAIL OF DESIGN STANDARD FOR PCCP
SHEET NO. 8	DETAIL OF PATH WALK COVER
SHEET NO. 9	BIKE LANE MARKINGS
SHEET NO. 10	LEGENDS / SYMBOLS
SHEET NO. 11	PROJECT BILLBOARD
SHEET NO. 12	DESIGN SUPER ELEVATION RATES & RUN - OFF
SHEET NO. 13	TABLES FOR STOPPING & PASSING SIGHT DISTANCE FOR CREST & SAG VERTICAL CURVES, DESIGN OF SUPER ELEVATION, SETTING - OUT HORIZONTAL & VERTICAL CURVES
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SHEET NO. 15	STANDARD DETAIL FOR BP344 AND PAVEMENT MARKINGS
SHEET NO. 16	MISCELLANEOUS DETAIL
SHEET NO. 17	DETAIL OF STANDARD CATCH BASIN
SHEET NO. 18	DETAIL OF STANDARD RCPC WINGWALL
SHEET NO. 19	DETAIL OF GROUTED RIPRAP & STONE MASONRY
SHEET NO. 20	PLAN
SHEET NO. 21	PROFILE
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SHEET NO. 35	SOLAR STREETLIGHT DETAIL



KEY MAP

THIS VICINITY



LOCATION MAP

NOT TO SCALE



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SPECIFICATIONS, INDEX OF
SHEET
LOCATION MAP, & KEY MAP

PREPARED & ENCODED

JULIE ANN S. DAVID
ENGINEER II

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SET NO.

TARLAC
2024

SHEET NO.

1
35

GENERAL NOTES :

1.0 SPECIFICATIONS

1. ALL WORKS SHALL COMPLY WITH THE DPWH STANDARD SPECIFICATIONS FOR HIGHWAYS, BRIDGES AND AIRPORTS 2013 EDITION VOLUME II, GEOMETRIC DESIGN OF HIGHWAYS AND STREET AASHTO 2011 16TH EDITION, SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS PERTAINING TO THE PROJECT

A. DIMENSIONS

1. UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS WHICH INCLUDE STATIONINGS, DISTANCE BETWEEN CONTROL POINTS AND DIMENSIONS OF PIPES AND BOX CULVERTS ARE MEASURED IN METERS.

B. STATIONINGS

1. THE ROAD STATIONINGS AND ELEMENTS OF CURVES ARE RELATIVE TO THE ULTIMATE CENTERLINE OF THE ROAD. EQUATIONS OF STATIONS WHEN USED (BACK STATION / AHEAD STATION) ARE PROVIDED AT THE BEGINNING OR END OF THE CURVE AND/OR AT THE FULL STATION.

C. OVERLAYS

1. IN CASES WHERE THE EXISTING PAVEMENT ELEVATION BETWEEN TWO - 20M. STATIONS IS ABOVE THE PROPOSED PLAN GRADE TO PROVIDE THE MINIMUM ASPHALT SHOWN ON THE PLANS FOR THE HIGHER PORTION.
2. BASIC TRAVERSE STATIONS WERE ESTABLISHED AT AN INTERVAL OF 500M USING STANDARD 20CM X 20CM X 60CM CONCRETE MONUMENTS ALONG THE PROPOSED SLOPE OF 1%. THE BEGINNING AND ENDING OF OVERLAY SHALL BE KEYED INTO EXISTING ASPHALT OR CONCRETE PAVEMENT IN SUCH A MANNER THAT A MINIMUM THICKNESS OF 5CM OF NEW ASPHALT IS MAINTAINED AT THE LOWER END OF THE TRANSITION. FEATHER EDGING WILL ONLY BE PERMITTED WHEN AN OVERLAY BEGINS OR TERMINATES ON CONCRETE PAVEMENT. ALL TERMINALS SHALL BE PLACED AT A SKEW

ANGLE

30 DEGREES UNLESS OTHERWISE SPECIFIED.

D. CHEMICALLY STABILIZED ROAD MIX SUB-BASE / BASE COURSE

1. THIS ITEM SHALL CONSIST OF APPLICATION OF POLYMER-BASED CHEMICAL SOIL ADDITIVE TO IMPROVE THE STRENGTH AND OTHER PROPERTIES OF ORDINARY SOIL FOR USE AS SUB-BAS/SURFACING MATERIALS IN ROADS IN ACCORDANCE WITH THIS SPECIFICATION AND IN CONFORMITY WITH THE REQUIREMENTS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

E. POLYMER-BASED CHEMICAL SOIL ADDITIVE

1. IT SHALL BE A POLYMER-BASED CHEMICAL SOIL ADDITIVE THAT IS NON-HAZARDOUS, ENVIRONMENTALLY SAFE, AND EASY TO USE.

F. CONCRETING

1. MATERIALS & WORKMANSHIP SHALL CONFORM WITH THE DPWH STANDARD SPECIFICATIONS FOR HIGHWAYS, BRIDGES & AIRPORTS 2013 EDITION VOLUME II.
2. CONSTRUCTION (CONTACT) JOINTS ARE FORMED WHEN CONCRETE ON ONE SIDE OF THE JOINT IS POURED AHEAD & ALLOWED TO SET BEFORE POURING ON THE OTHER SIDE.
3. AT CONSTRUCTION JOINTS (LONGITUDINAL OR TRANSVERSE) CARE SHOULD BE TAKEN THAT NO CONCRETE FROM THE LAST SLAB FACE OVERHANGS ANY PORTION OF THE FIRST SLAB.
4. TIE BARS SHOULD BE DEFORMED STEEL BARS, ALL DOWEL BARS SHALL BE SMOOTH ROUND STEEL.
5. TYPE OF WEAKENED PLANE JOINT TO BE USED SHALL BE AS SPECIFIED IN THE PLANS AND ONLY ONE TYPE SHALL BE USED FOR THE WHOLE PROJECT.
6. MATERIAL FOR THE METAL SIDE FORM SHALL BE BRAND NEW SHEET METAL GAUGE NO.18 OF BLACK IRON FREE FROM RUST & KINKS.
7. AT LEAST SIX (6) SUCCESSION DOWELLED BUTT JOINTS AT NORMAL JOINT SPACING SHALL BE PROVIDED BEFORE OR AFTER AN EXPANSION JOINT.
8. THE GROOVE OR CRACK ABOVE JOINTS (LONGITUDINAL OR TRANSVERSE) SHALL BE SEALED WITH 30 - 50 PENETRATION ASPHALT SEAL OR COLD APPLIED LIQUID RUBBER COMPOUND AFTER THE CONCRETE HAD BEEN CURED & BEFORE OPENING THE PAVEMENT TO TRAFFIC. PENETRATION ASPHALT SEAL OR CONCRETE PAVEMENT SHOULD BE POURED ON SUCH MANNER THAT SPILLING WILL BE ELIMINATED / PREVENTED THUS, PROVIDE A SMOOTH LEVELLING SURFACE.
9. ALL TRANSVERSE JOINTS, EXCEPT CONSTRUCTION JOINT SHALL BE CONTINUOUS FROM EDGE TO EDGE.
10. ALL LONGITUDINAL JOINTS SHALL MEET AT INTERSECTION WITH NO GAPS & OFFSETS.
11. PURSUANT TO THE GAA FY-2007, SEC. 32 & 33: ALL GOVERNMENT FACILITIES, INCLUDING INFRA, NON-INFRA AND CIVIL WORKS PROJECTS OF THE GOVERNMENT AS WELL AS OFFICE BUILDINGS, STREETS AND HIGHWAYS, SHALL PROVIDE ARCHITECTURAL / STRUCTURAL FEATURES AND DESIGNS THAT SHALL REASONABLY ENHANCE THE MOBILITY, SAFETY AND WELFARE OF DIFFERENTLY-ABLED PERSONS PURSUANT TO B.P. BLG. 344 AND R.A. NO. 7277. PAYMENT SHALL BE SUBSIDIARY TO OTHER PAY ITEM.
12. SURFACE TEST ON THE COMPLETED CONCRETE PAVEMENT SHALL HAVE AN INTERNATIONAL ROUGHNESS INDEX (IRI) OF NOT MORE THAN 3.0 M/KM FOR NATIONAL PRIMARY ROAD, MEASURED IN 100 M. SECTIONS, AT THE TIME OF COMPLETION ON CONFORMITY WITH D.O. # 47, SERIES OF 2015.

G. REMOVAL OF EXISTING STRUCTURES, OBSTRUCTIONS AND MISCELLANEOUS ROADWAY STRUCTURES

1. PORTIONS OF EXISTING UTILITIES, SUCH AS WATER MAINS, IRRIGATION CHANNELS, TELEPHONE POST AND TRUNK LINES, ETC. THAT MAY CAUSE OBSTRUCTION TO THE CONSTRUCTION OF THIS PROJECT SHALL BE RELOCATED BY THE ENTITY OR OWNER CONCERNED. EXTREME PRECAUTIONS SHALL BE EXERCISED BY THE CONTRACTOR NOT TO DAMAGE ANY SECTION OF THE EXISTING PUBLIC UTILITIES DURING CONSTRUCTION. ANY DAMAGE THEREOF SHALL BE ON THE ACCOUNT OF THE CONTRACTOR.
2. ANY REMOVAL OF MISCELLANEOUS STRUCTURES THAT MAY BE REQUIRED INCLUDING ANY EXISTING CONCRETE PAVEMENT AFFECTED BY THE PROPOSED GRADE AND/OR ALIGNMENT SHALL BE CONSIDERED AS SUBSIDIARY WORK PERTAINING TO OTHER CONTRACT ITEMS. NO DIRECT PAYMENT SHALL BE MADE FOR THIS WORK EXCEPT FOR SPECIFIC ITEMS EXPLICITLY IDENTIFIED FOR PAYMENT IN THE BID SCHEDULE.

H. ROAD CONNECTIONS AND PRIVATE ENTRANCES

1. APPROACHES AND MINOR ROAD CONNECTIONS SHALL BE CONSTRUCTED BY THE CONTRACTOR AS DIRECTED BY THE ENGINEER IN SUCH MANNER TO ENSURE SMOOTH CONNECTIONS AND RIDING QUALITY.
2. EXACT LOCATIONS OF CONNECTING ROADS AND PRIVATE ENTRANCES OR DRIVEWAYS SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER.

I. DRAINAGE STRUCTURES

1. ANY REVISIONS, REMOVAL AND/OR RE-LAYING OF DRAINAGE STRUCTURES AS DIRECTED BY THE ENGINEER TO SUIT EXISTING FIELD CONDITIONS SHALL BE CONSIDERED AS SUBSIDIARY WORK PERTAINING TO OTHER CONTRACT ITEMS. NO DIRECT PAYMENT SHALL BE MADE FOR THIS WORK UNLESS OTHERWISE IDENTIFIED FOR PAYMENT IN THE BID SCHEDULE.
2. EXISTING DRAINAGE STRUCTURES OR PART THEREOF REMOVED BY THE CONTRACTOR THAT ARE STILL SERVICEABLE SHALL BE TURNED OVER TO THE GOVERNMENT AND SHALL BE DEPOSITED AT A PLACE WITHIN THE PROJECT SITE DESIGNATED BY THE ENGINEER WITHOUT ANY EXTRA COMPENSATION. EXTREME PRECAUTION SHALL BE EXERCISE BY THE CONTRACTOR NOT TO DAMAGE THESE MATERIALS DURING THE REMOVAL AND HANDLING.

J. STANDARD GRADIENT FOR ROAD CUT SLOPES

1. ON THE CUT SLOPES, BERMS 1.0 TO 2.0M. WIDE ARE GENERALLY PROVIDED FOR EVERY 3.0M VERTICAL HEIGHT FOR FILL / EMBANKMENT SECTION AND EVERY 5.0M TO 7.0 M. VERTICAL HEIGHT FOR CUT SECTIONS. FOR THE FOLLOWING PURPOSES:
- TO REDUCE SPEED OF THE SURFACE WATER FLOW ON THE CUT SLOPES, THEREBY DECREASING SCOURING FORCE ON THE CUT SLOPES;
- TO PROVIDE A PLACE FOR THE INSTALLATION OF DRAINAGE DITCHES; AND
- TO BE USED AS SHOULDER FOR INSPECTION OR AS SCAFFOLDING FOR REPAIR WORKS.

K. ROAD SAFETY

1. ROAD SAFETY MANUAL DATED MAY 2012 SHALL BE ADOPTED

DESIGN STANDARDS REFERENCES:

1. DPWH DESIGN GUIDELINES, CRITERIA, AND STANDARDS (DGCS), VOLUME 4, 2015 EDITION
2. AASHTO A POLICY ON GEOMETRIC DESIGN STANDARD OF HIGHWAYS AND STREETS, 2011, 6TH EDITION
3. AASHTO GUIDE ON PAVEMENT DESIGN, 1993 EDITION
4. HIGHWAY SAFETY DESIGN STANDARDS: PART 1 - ROAD SAFETY DESIGN AND PART 2 - ROAD SIGNS AND PAVEMENT MARKINGS, 2012 EDITION
5. SURVEY SPECIFICATIONS; DGCS 2015 VOLUME 2(A, B & C)
6. EQUIPMENT USED ON SURVEY; GNSS (RTK)

DESIGN PARAMETERS :

Cumulative Equivalent Standard Axle Load , CESAL =
Design Life = 20 YEARS
Assumed Traffic Growth Rate , TGR = 4.00%
Representative CBR =
Resilient Modulus , MR (from GRAPH) =
Reliability , R = 85%
Z_R = -1.037
Overall Standard Deviation , S_o = 0.35
Initial Serviceability Index, P_o = 4.50
Terminal Serviceability Index, P_T = 2.50
Present Serviceability Index, ΔP_{si} = 2.00
PCCP Modulus of Elasticity, E_c = 3.60E+06
PCCP Modulus of Rupture, S_c (650 psi @ 28 days) = 751
Drainage Coefficient , C_d = 1.00
Load Transfer Coefficient , J = 3.10
Loss of Support, L.S. = 1.00
Effective Modulus of Subgrade Reaction , k =
PCCP thickness (thickness to carry future traffic) = 230MM
Aggregate Sub Base Course thickness = 200MM

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			DATE:	DATE:	DATE:	DATE:	DATE:			

CONSTRUCTION LIMITS

Item 311(1)c1 Portland Cement Concrete Pavement (Unreinforced) 0.23m thk @ 14 days

Construction Limits:

STA. 0+000.00 - STA. 0+381.99 = 381.99 L.M. (Section 1)
STA. 0+000.00 - STA. 0+200.53 = 200.53 L.M. (Section 2)
STA. 0+000.00 - STA. 0+069.00 = 69.00 L.M. (Section 3)

For Lined Canal:

Construction Limits:

STA. 0+260.00 - STA. 0+381.99 = $\frac{121.99}{121.99}$ l.m. (R/S)

Item 500(1)a1 Pipe Culverts, 610 mm dia., Class II, RCPC

Construction Limits:

STA. 0+000.00 - STA. 0+260.00 = $\frac{260.00}{260.00}$ l.m. (R/S)

Item 505(2)a Grouted Riprap, Class A

Construction Limits:

STA. 0+000.00 - STA. 0+150.00 = 150.00 l.m. (L/S)

Item 506(1) Stone Masonry

Construction Limits:

STA. 0+290.00 - STA. 0+330.00 = 40.00 l.m. (L/S)

Item 600(4) Curb and Gutter, Cast in place

Construction Limits:

STA. 0+000.00 - STA. 0+260.00 = 260.00 l.m. L/S
STA. 0+000.00 - STA. 0+260.00 = $\frac{260.00}{520.00}$ l.m. R/S

For Pathwalk:

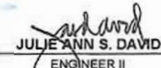
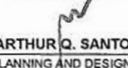
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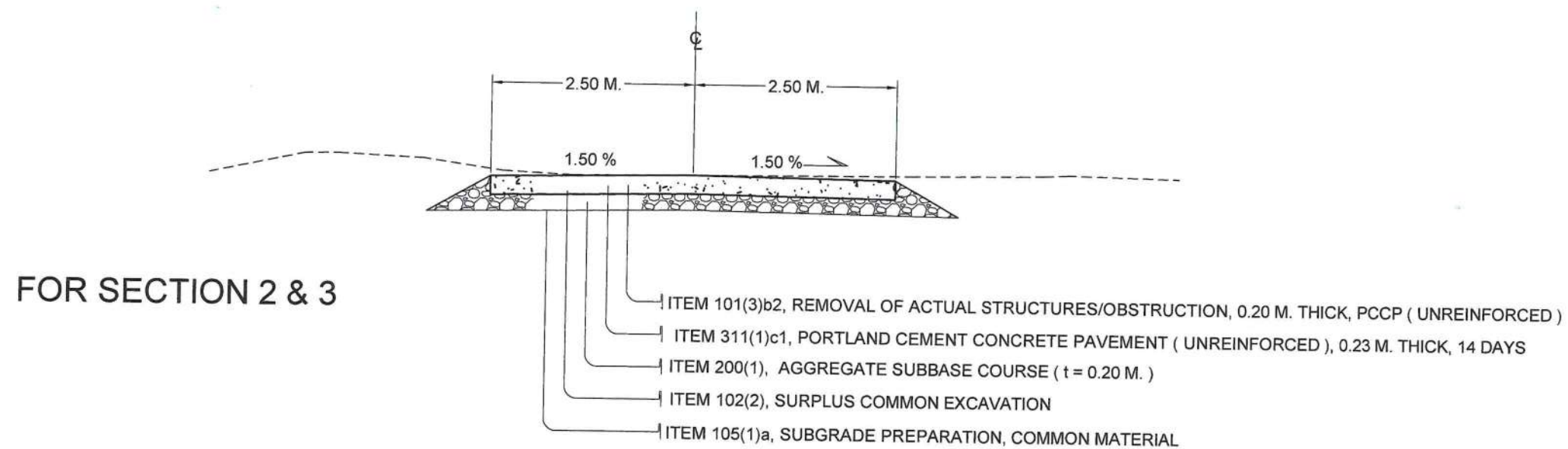
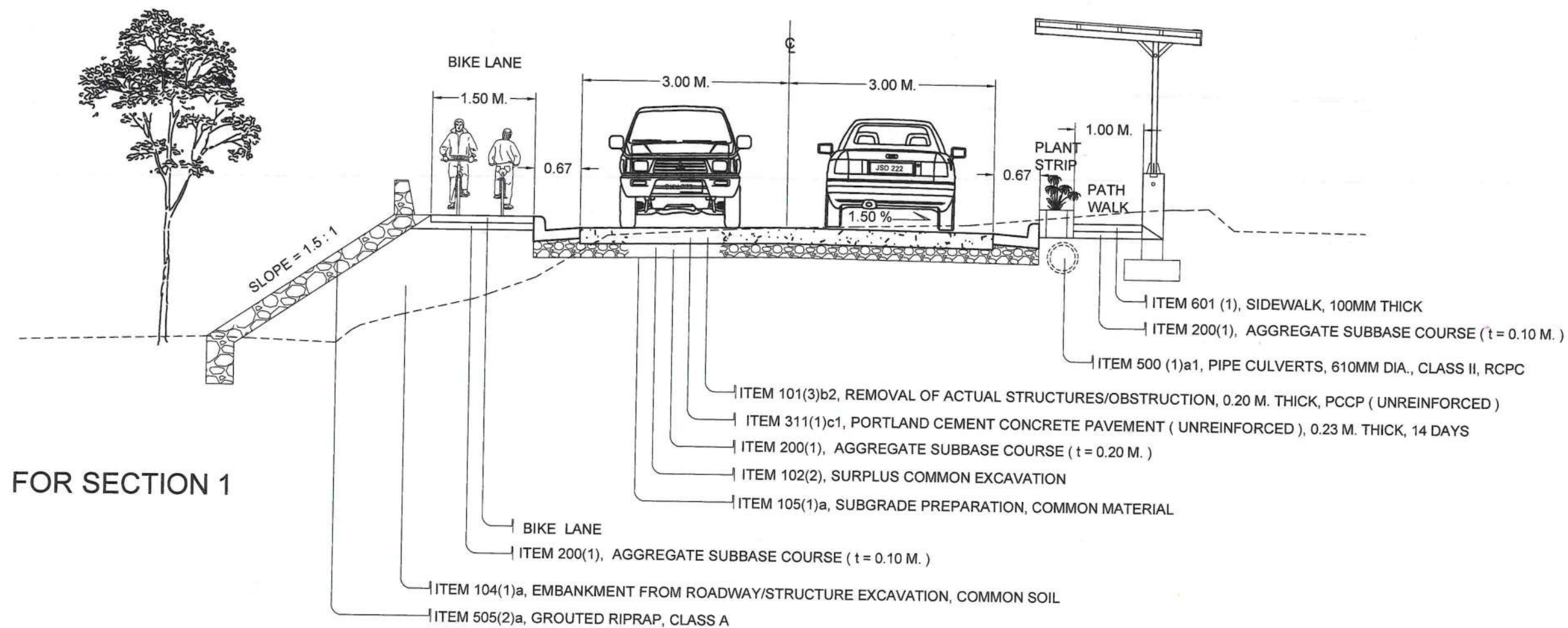
STA. 0+000.00 - STA. 0+260.00 = 260.00 l.m. R/S

For Bike lane

Construction Limits:

STA. 0+000.00 - STA. 0+260.00 = 260.00 l.m. L/S

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			 JULIE ANN S. DAVID ENGINEER II	 CARINA O. GAZO CHIEF, BRIDGE & OTHER PUBLIC WORKS DESIGN SECTION	 ARTHUR Q. SANTOS CHIEF, PLANNING AND DESIGN DIVISION	 MELQUIADES H. STO. DOMINGO ASSISTANT REGIONAL DIRECTOR	 ROSELLER A. TOLENTINO REGIONAL DIRECTOR	 SILVERIO RAMON D. SALUNSON, DBA UNIVERSITY PRESIDENT TARLAC AGRICULTURAL UNIVERSITY	TARLAC 2024	4 35

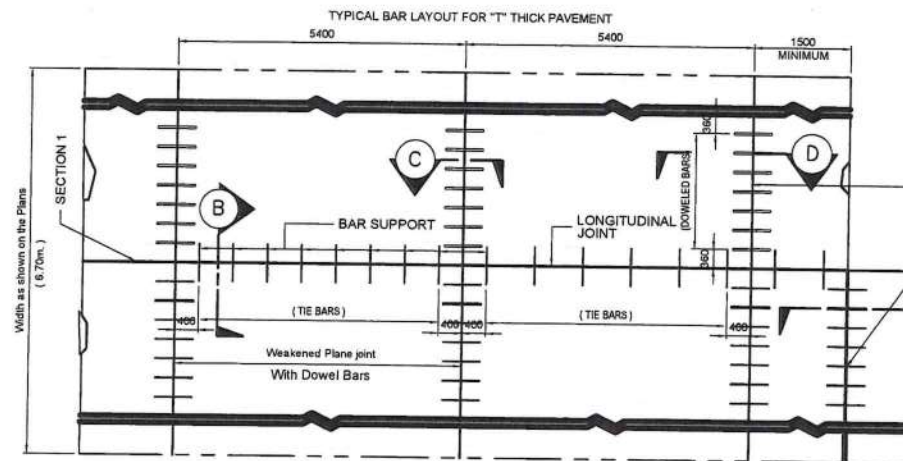


TYPICAL ROADWAY SECTION

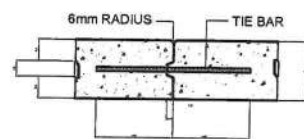
SCALE :

1 : 50 M.

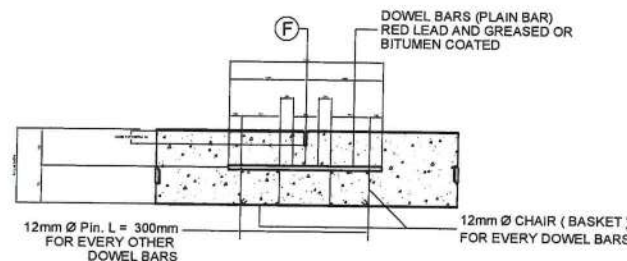
REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS & HIGHWAYS REGIONAL OFFICE NO. 3 PLANNING AND DESIGN DIVISION SINDALAN, CITY OF SAN FERNANDO (P)	C.Y. 2024 PROJECT DETAIL ENGINEERING DESIGN PLAN FOR STATE UNIVERSITIES AND COLLEGES (SUCs) REPAIR AND REHABILITATION OF ROAD NETWORKS WITH PROVISION OF WALKABLE PEDESTRIAN PATHWAYS FOR EMPLOYEES AND STUDENTS AND THOSE WITH SPECIAL NEEDS (PHASE 1) TARLAC AGRICULTURAL UNIVERSITY PROVINCE OF TARLAC	TYPICAL ROAD SECTIONS	PREPARED & ENCODED JULIE ANN S. DAVID ENGINEER II	REVIEWED CARINA C. GAZO CHIEF, BRIDGE & OTHER PUBLIC WORKS DESIGN SECTION DATE:	SUBMITTED ARTHUR O. SANTOS CHIEF, PLANNING AND DESIGN DIVISION DATE:	RECOMMENDED MELQUIADES H. STO. DOMINGO ASSISTANT REGIONAL DIRECTOR DATE:	APPROVED ROSELLER A. TOLENTINO REGIONAL DIRECTOR DATE:	CONCURRED SILVERIO R. BALONSON, DBA UNIVERSITY PRESIDENT TARLAC AGRICULTURAL UNIVERSITY DATE:	SET NO. TARLAC 2024 SHEET NO. 5 35
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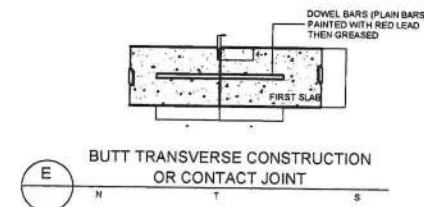
TYPICAL PLAN OF A TWO - LANE DOWELED PAVEMENT
NOT TO SCALE



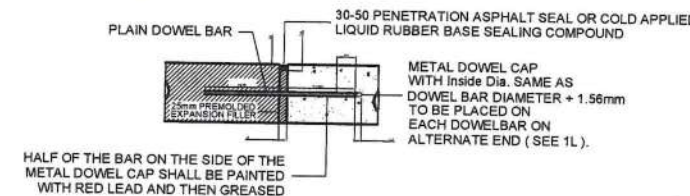
B LONGITUDINAL CONSTRUCTION JOINT
(TO BE USED FOR ONE LANE CONSTRUCTION)



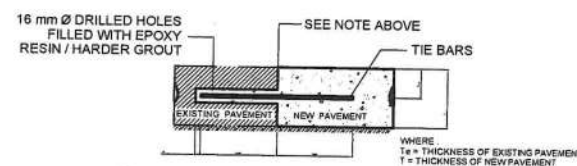
C CONTRACTION JOINT SECTION
STEEL BASKET FOR SETTING DOWELS



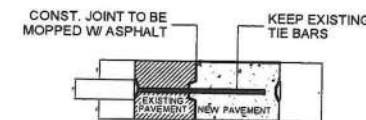
E BUTT TRANSVERSE CONSTRUCTION
OR CONTACT JOINT



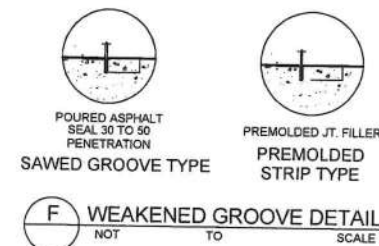
D DOWELLED EXPN. JOINT DETAIL



H CONSTRUCTION JOINT
(TO BE USED FOR WIDENING EXISTING
CONCRETE PAVEMENT)



I LONGITUDINAL CONST'N. JT.
(TO BE USED FOR CONNECTIONS WITH EXISTING
CONCRETE PAVEMENT AND NEW PAVEMENT)



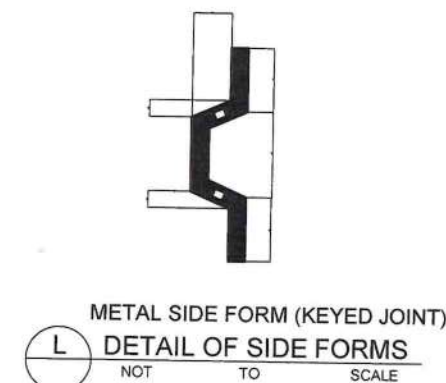
F WEAKENED GROOVE DETAIL
NOT TO SCALE

TABLE FOR SPACING OF TIE BARS (L=600mm)		
SLAB THICKNESS (mm)	SPACING, S1 (mm)	
	12mm Ø	16mm Ø
230	600	750
240	600	750
250	600	750
260	500	750
270	500	750
280	500	750
290	500	750
300	500	750
310	400	750
320	400	750
330	400	750
340	400	750

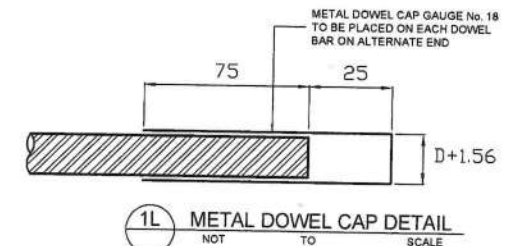
Based on AASHTO Guide for the Design of Pavement Structures 1993

TABLE FOR SPACING OF DOWEL BARS (L=600mm)				
SLAB DEPTH, (T) (mm)	SPACING FOR 36mmØ DOWEL BAR (mm)	SPACING FOR 32mmØ DOWEL BAR (mm)	SPACING FOR 28mmØ DOWEL BAR (mm)	SPACING FOR 25mmØ DOWEL BAR (mm)
280	300	250	190	150
290	290	230	170	140
300	270	210	160	130
310	250	200	150	120
320	230	190	140	110
330	220	180	130	110
340	200	170	130	100

Based on AASHTO Guide for the Design of Pavement Structures 1993



L METAL SIDE FORM (KEYED JOINT)
DETAIL OF SIDE FORMS
NOT TO SCALE



1L METAL DOWEL CAP DETAIL
NOT TO SCALE

NOTE:

1. MATERIALS AND WORKMANSHIP SHALL CONFORM WITH THE "DPWH STANDARD SPECIFICATIONS FOR HIGHWAYS, BRIDGES AND AIRPORTS, 2013".
2. CONSTRUCTION (CONTACT) JOINTS ARE FORMED WHEN CONCRETE ON ONE SIDE OF THE JOINT IS POURED AHEAD AND ALLOWED TO SET BEFORE POURING ON THE OTHER SIDE. NO CONSTRUCTION JOINT SHALL BE PLACED WITHIN 1.50m FROM THE WEAKENED PLANE JOINT.
3. AT CONSTRUCTION JOINTS (LONGITUDINAL OR TRANSVERSE) CARE SHOULD BE TAKEN THAT NO CONCRETE FROM THE LAST SLAB PLACED OVERHANGS ANY PORTION OF THE FIRST SLAB.
4. TIE BARS SHOULD BE DEFORMED STEEL BARS. ALL DOWEL BARS SHALL BE SMOOTH ROUND STEEL BAR FREE FROM RUST AND OTHER DEFECTS (REFER TO CLAUSE 3; 1.3.12. THE STANDARD SPECIFICATION FOR ROADS AND BRIDGES 1995).
5. TYPE OF WEAKENED PLANE JOINT TO BE USED SHALL BE AS SPECIFIED IN THE PLANS AND ONLY ONE TYPE SHALL BE USED FOR THE WHOLE PROJECT.
6. MATERIAL FOR THE METAL SIDE FORM SHALL BE BRAND NEW SHEET METAL GAUGE No. 18 OF BLACK IRON FREE FROM RUST AND LINKS.
7. AT LEAST SIX (6) SUCCESSIVE DOWELLED BUTT JOINTS AT NORMAL JOINT SPACING SHALL BE PROVIDED BEFORE OR AFTER AN EXPANSION JOINT.
8. THE GROOVE OR CRACK ABOVE JOINTS (LONGITUDINAL OR TRANSVERSE) SHALL BE SEALED WITH 30-50 PENETRATION ASPHALT SEAL OR COLD APPLIED LIQUID RUBBER COMPOUND AFTER THE CONCRETE HARDENS AND BEFORE OPENING THE PAVEMENT TO TRAFFIC. PENETRATION ASPHALT SEAL ON CONCRETE PAVEMENT, JOINTS SHALL BE POURED IN SUCH MANNER THAT SPILLING WILL BE ELIMINATED / PREVENTED. THUS, PROVIDING A SMOOTH LEVELING / RIDING SURFACE.
9. ALL TRANSVERSE JOINTS, EXCEPT CONSTRUCTION JOINT SHALL BE CONTINUOUS FROM EDGE TO EDGE.
10. ALL LONGITUDINAL JOINTS SHALL MEET AT INTERSECTIONS WITH NO GAPS OR OFFSET.
11. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
12. AVOID STOPPAGE OF FORMWORKS ALONG CURVES.



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS & HIGHWAYS
REGIONAL OFFICE NO. 3
PLANNING AND DESIGN DIVISION
SINDALAN, CITY OF SAN FERNANDO (P)

C.Y. 2024 PROJECT
DETAIL ENGINEERING DESIGN PLAN FOR
STATE UNIVERSITIES AND COLLEGES (SUCs)
REPAIR AND REHABILITATION OF ROAD NETWORKS WITH
PROVISION OF WALKABLE PEDESTRIAN PATHWAYS FOR
EMPLOYEES AND STUDENTS AND THOSE WITH SPECIAL
NEEDS (PHASE 1)
TARLAC AGRICULTURAL UNIVERSITY
PROVINCE OF TARLAC

DESIGN STANDARD FOR
PORTLAND CEMENT CONCRETE
PAVEMENT (PCCP)

PREPARED & ENCODED:

JULIE ANN S. DAVID
ENGINEER II

REVIEWED:

CARINA C. GAZO
CHIEF, BRIDGE & OTHER PUBLIC WORKS
DESIGN SECTION
DATE:

SUBMITTED:

ARTHUR Q. SANTOS
CHIEF, PLANNING AND DESIGN DIVISION
DATE:

RECOMMENDED:

MELOQUIADES H. STO. DOMINGO
ASSISTANT REGIONAL DIRECTOR
DATE:

APPROVED:

ROSELLER A. TOLENTINO
REGIONAL DIRECTOR
DATE:

CONCURRED:

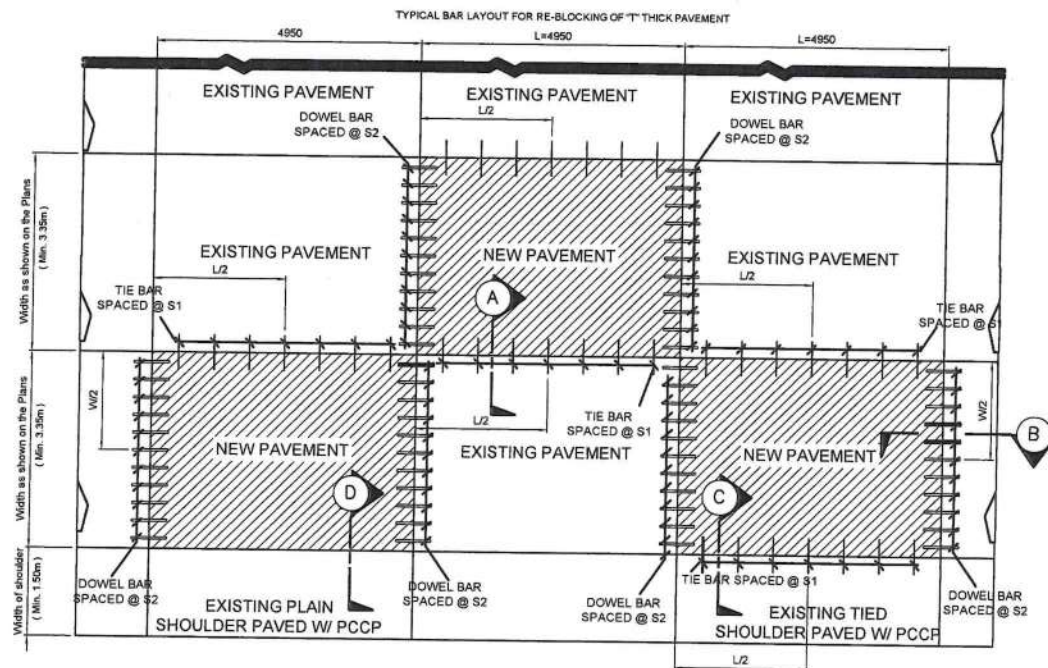
SILVERIO R. GARCIA, DBA
UNIVERSITY PRESIDENT
TARLAC AGRICULTURAL UNIVERSITY
DATE:

SET NO.

TARLAC
2024

SHEET NO.

6
35



TYPICAL PLAN OF A MULTI-LANE PAVEMENT FOR RE-BLOCKING
NOT TO SCALE

TABLE FOR SPACING (S2) OF DOWEL BARS (L=600mm)				
SLAB DEPTH, (T) (mm)	SPACING FOR 36mmØ DOWEL BAR (mm)	SPACING FOR 32mmØ DOWEL BAR (mm)	SPACING FOR 28mmØ DOWEL BAR (mm)	SPACING FOR 25mmØ DOWEL BAR (mm)
280	300	250	190	150
290	290	230	170	140
300	270	210	160	130
310	250	200	150	120
320	230	190	140	110
330	220	180	130	110
340	200	170	130	100

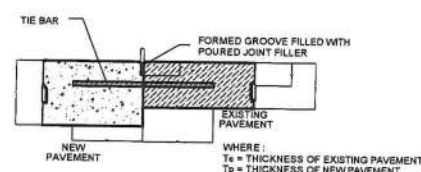
Based on AASHTO Guide for the Design of Pavement Structures 1993
Note: Dowel Bar spacing will be based from the thickness of the New Pavement

TABLE FOR SPACING (S1) OF TIE BARS (L=600mm)		
SLAB THICKNESS (mm)	SPACING, S1 (mm)	
	12mm Ø	16mm Ø
230	600	750
240	600	750
250	600	750
260	500	750
270	500	750
280	500	750
290	500	750
300	500	750
310	400	750
320	400	750
330	400	750
340	400	750

Based on AASHTO Guide for the Design of Pavement Structures 1993
Note: Tie Bar spacing will be based from the thickness of the New Pavement

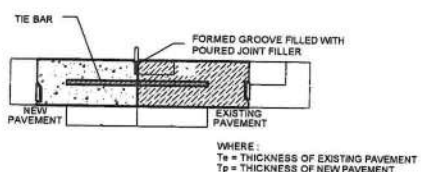
NOTE:

- MATERIALS AND WORKMANSHIP SHALL CONFORM WITH THE "DPWH STANDARD SPECIFICATIONS FOR HIGHWAYS, BRIDGES AND AIRPORTS, 2013".
- CONSTRUCTION (CONTACT) JOINTS ARE FORMED WHEN CONCRETE ON ONE SIDE OF THE JOINT IS POURED AHEAD AND ALLOWED TO SET BEFORE POURING ON THE OTHER SIDE. NO CONSTRUCTION JOINT SHALL BE PLACED WITHIN 1.50m FROM THE WEAKENED PLANE JOINT.
- AT CONSTRUCTION JOINTS (LONGITUDINAL OR TRANSVERSE) CARE SHOULD BE TAKEN THAT NO CONCRETE FROM THE LAST SLAB PLACED OVERHANGS ANY PORTION OF THE FIRST SLAB.
- TIE BARS SHOULD BE DEFORMED STEEL BARS. ALL DOWEL BARS SHALL BE SMOOTH ROUND STEEL BAR FREE FROM RUST AND OTHER DEFECTS (REFER TO CLAUSE 3; 1,3,12. THE STANDARD SPECIFICATION FOR ROADS AND BRIDGES 1995.).
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- ALL TRANSVERSE JOINTS, EXCEPT CONSTRUCTION JOINT SHALL BE CONTINUOUS FROM EDGE TO EDGE.
- ALL LONGITUDINAL JOINTS SHALL MEET AT INTERSECTIONS WITH NO GAPS OR OFFSET.
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
- AVOID STOPPAGE OF FORMWORKS ALONG CURVES.
- INSTALLATION OF DOWEL AND TIE BARS SHOULD START RESPECTIVELY FROM THE CENTER OF THE WIDTH AND LENGTH OF THE PAVEMENT AS SHOWN IN THE PLAN, AND SHOULD BE SPACED ACCORDING TO THE TABLE ABOVE.
- THE DESIGNER HAS THE DISCRETION OF USING A PLAIN OR TIED SHOULDER DEPENDING ON THE VALUE OF THE LOAD TRANSFER COEFFICIENT "J" TO BE USED IN THE DETERMINATION OF THE THICKNESS OF THE PAVEMENT.



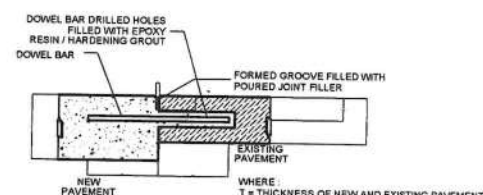
SECTION 1

(TO BE USED FOR CONNECTIONS WITH EXISTING PAVEMENT AND NEW PAVEMENT WITH DIFFERENT THICKNESS)



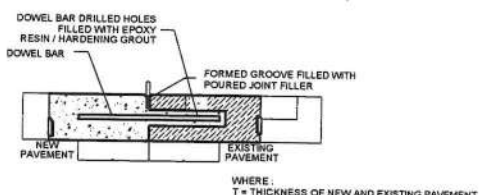
SECTION 2

(TO BE USED FOR CONNECTIONS WITH EXISTING PAVEMENT AND NEW PAVEMENT WITH SAME THICKNESS)



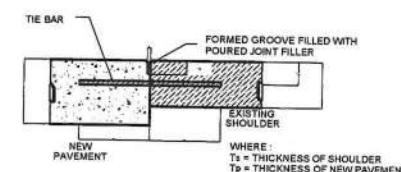
SECTION 1

(TO BE USED FOR CONNECTIONS WITH EXISTING PAVEMENT AND NEW PAVEMENT WITH DIFFERENT THICKNESS)



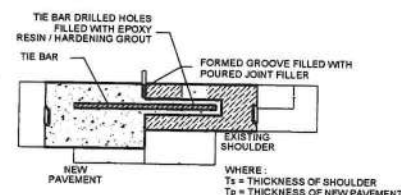
SECTION 2

(TO BE USED FOR CONNECTIONS WITH EXISTING PAVEMENT AND NEW PAVEMENT WITH SAME THICKNESS)



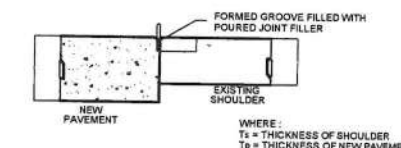
SECTION 1

(TO BE USED FOR CONNECTIONS WITH EXISTING TIED SHOULDER AND NEW PAVEMENT)



SECTION 2

(TO BE USED FOR CONNECTIONS WITH EXISTING PLAIN SHOULDER TO BE TIED WITH THE NEW PAVEMENT)



SECTION 2
(TO BE USED FOR CONNECTIONS WITH EXISTING PLAIN SHOULDER AND NEW PAVEMENT)

A LONGITUDINAL CONST'N JOINT
(NEW AND EXISTING PAVEMENT)

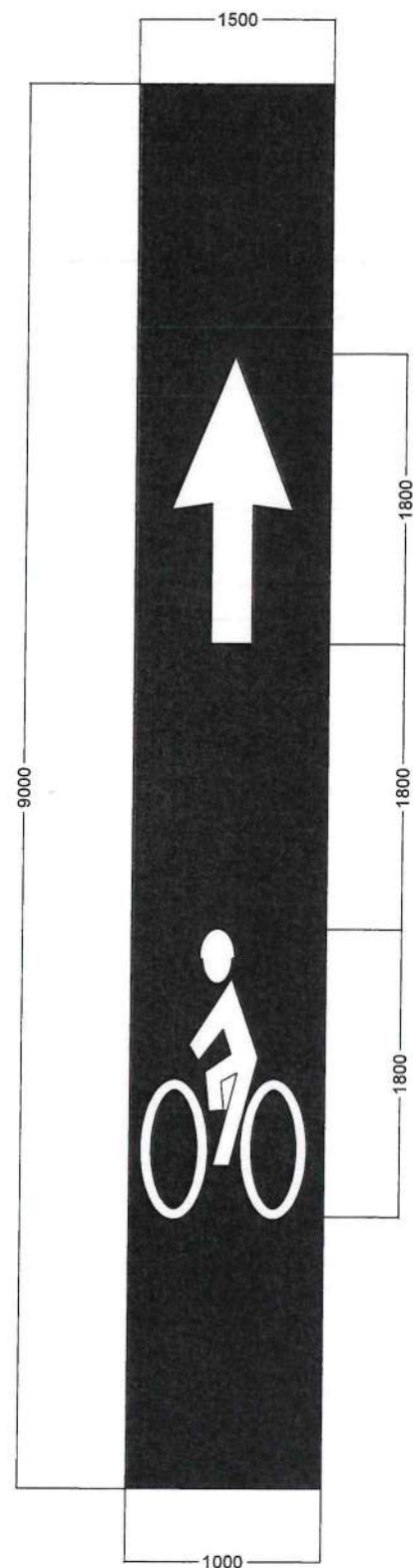
B TRANSVERSE CONST'N JOINT
(NEW AND EXISTING PAVEMENT)

C LONGITUDINAL CONST'N. JT.
(NEW PAVEMENT AND TIED SHOULDER)

D LONGITUDINAL CONST'N. JT.
(NEW PAVEMENT AND PLAIN SHOULDER)

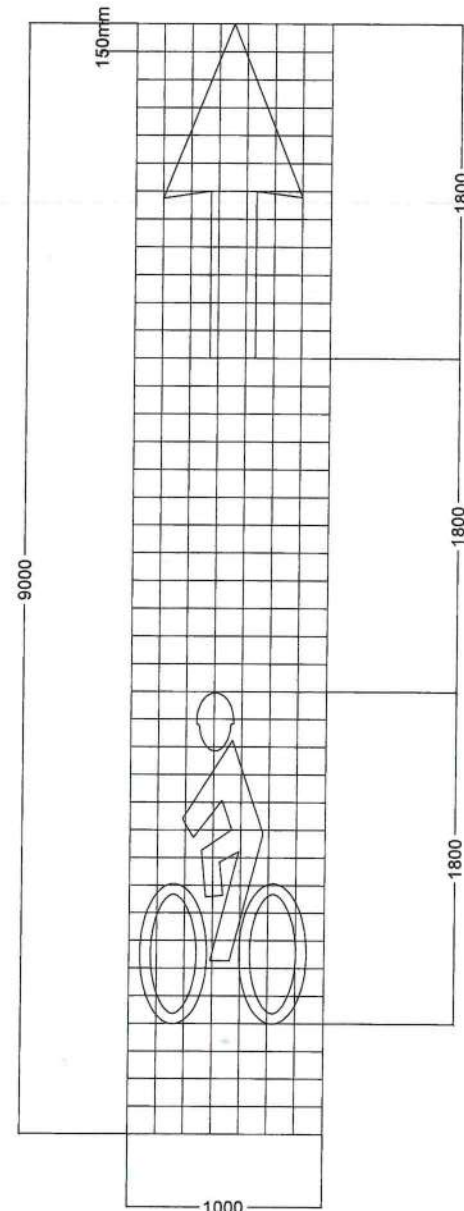


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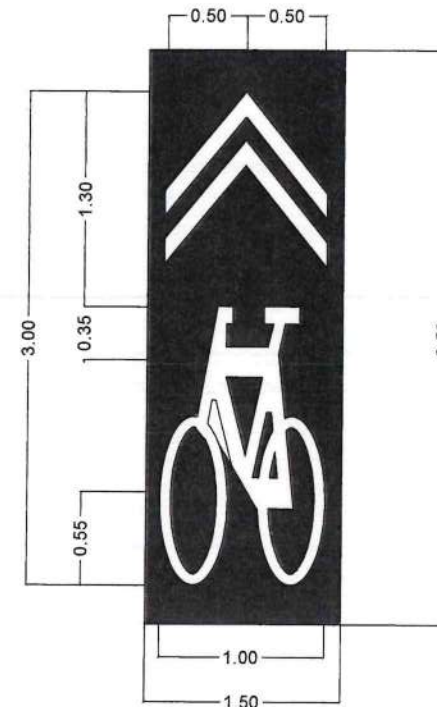


NOTE:
REFLECTORIZED WHITE MARKING
REFLECTORIZED GREEN BACKGROUND

COLORED CONFLICT AREA PAVEMENT MARKING

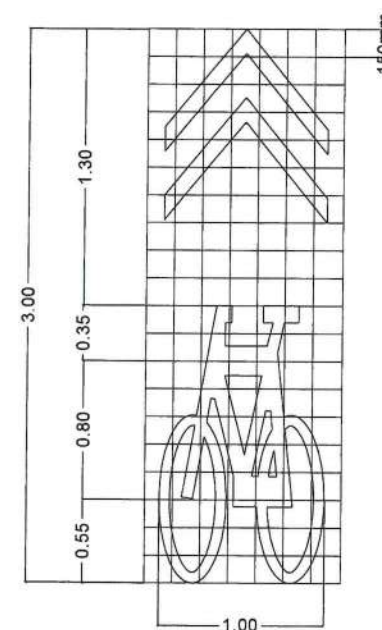


HELMETED RIDER WITH ARROW DETAILS



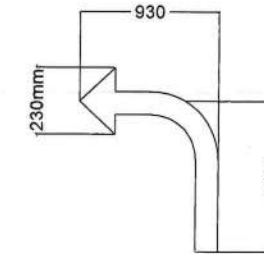
NOTE:
REFLECTORIZED WHITE MARKING
REFLECTORIZED GREEN BACKGROUND (USED
FOR SHARED ROAD)

SHARROW PAVEMENT MARKINGS

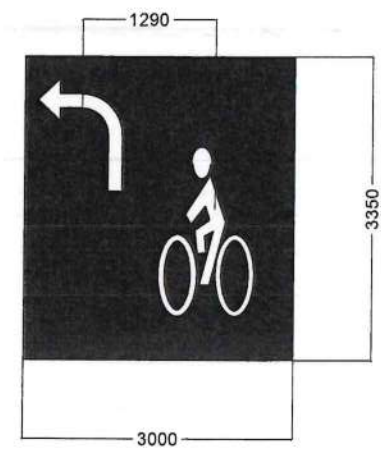


SHARROW MARKING DETAILS

NOTE:
REFLECTORIZED WHITE MARKING
REFLECTORIZED GREEN BACKGROUND (USED
FOR SHARED ROAD)



LEFT TURN PAVEMENT MARKINGS

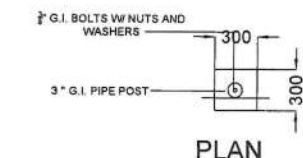
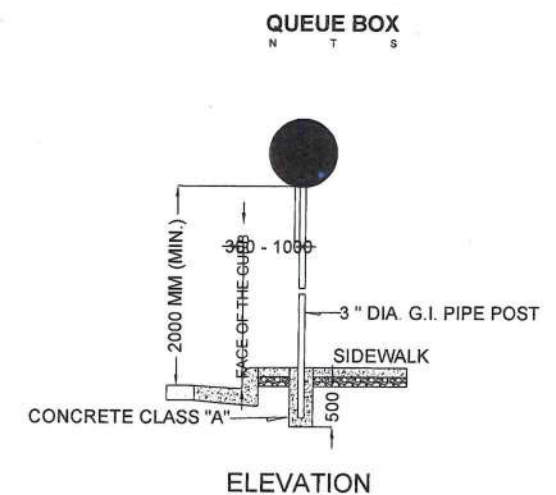


NOTE:
REFLECTORIZED WHITE MARKING
REFLECTORIZED GREEN BACKGROUND (USED
FOR SHARED ROAD)



NOTE:
REFLECTORIZED GREEN PAINT

DASHED PAVEMENT MARKINGS



INSTALLATION DETAIL

SCALE 1:50

NOTES:

1. THE DIMENSIONS, SIZES OF LETTERS AND NUMBERS, SHAPE, COLOR AND INSTALLATION SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS OF DPWH HIGHWAY SAFETY STANDARD PART: ROAD SIGNS AND PAVEMENT MARKINGS MANUAL 2012.
2. ROAD SIGNS SHALL BE PLAIN CEMENTFINISH, AND SMOOTHENED AND TREATED WITH CONCRETE NEUTRALIZER AND PRIMER PRIOR TO THE APPLICATION OF RETRO REFLECTIVE MATERIALS/STICKERS ON LEGENDS, LETTERS, BORDERS AND BACKGROUND OF THE SIGN SLAB AS DIRECTED BY THE ENGINEER.

REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS & HIGHWAYS REGIONAL OFFICE NO. 3 PLANNING AND DESIGN DIVISION SINDALAN, CITY OF SAN FERNANDO (P)	C.Y. 2024 PROJECT DETAIL ENGINEERING DESIGN PLAN FOR STATE UNIVERSITIES AND COLLEGES (SUCs) REPAIR AND REHABILITATION OF ROAD NETWORKS WITH PROVISION OF WALKABLE PEDESTRIAN PATHWAYS FOR EMPLOYEES AND STUDENTS AND THOSE WITH SPECIAL NEEDS (PHASE 1) TARLAC AGRICULTURAL UNIVERSITY PROVINCE OF TARLAC	BIKE LANE MARKINGS	PREPARED & ENCODED: JULIE ANN S. DAVID ENGINEER II	REVIEWED: CARINA G. GAZO CHIEF, BRIDGE & OTHER PUBLIC WORKS DESIGN SECTION DATE:	SUBMITTED: ARTHUR Q. SANTOS CHIEF, PLANNING AND DESIGN DIVISION DATE:	RECOMMENDED: MELQUIADES H. STO. DOMINGO ASSISTANT REGIONAL DIRECTOR DATE:	APPROVED: ROSELER A. TOLENTINO REGIONAL DIRECTOR DATE:	CONCURRED: SILVERIO R. RAMOS, DBA UNIVERSITY PRESIDENT TARLAC AGRICULTURAL UNIVERSITY DATE:	SET NO. TARLAC 2024	SHEET NO. 9 35
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EXISTING TOPOGRAPHIC FEATURES						NEW TOPOGRAPHIC FEATURES					
CONTOUR		SINGLE BOX CULVERT		CONCRETE HOUSE		PROJECT ROAD		DITCH FLOW		HORIZONTAL CONTROL MONUMENT	
BANANA / ABACA / COCONUT PLANTS		DOUBLE BOX CULVERT		SEMI-CONCRETE HOUSE		C OF PROJECT ROAD		EARTH DITCH		GPS MONUMENT	
FOREST		SINGLE PIPE CULVERT / VIA SYPHON		WOODEN HOUSE		BRIDGE		LINED DITCH			
TREES		DOUBLE PIPE CULVERT		WATER TANK		SINGLE RC PIPE CULVERT		POINT OF INTERSECTION			
SWAMP OR MARSHLAND		DITCH FLOW		CONCRETE FENCE		DOUBLE RC PIPE CULVERT		SECTION TARGET			
RICE FIELD		WOOD FENCE		BARBED WIRE FENCE		TRIPLE RC PIPE CULVERT		GRID COORDINATES			
GRASS		GUARDRAIL		ARTESIAN / DEEP WELL		QUINTET RC PIPE CULVERT		NORTH SIGNS			
CLIFF		KILOMETER POST		BENCH MARK		EMBANKMENT		FINISHED GRADE ON PROFILE			
OTHER CULTIVATED LAND		BAILEY BRIDGE		PORTLAND CEMENT CONCRETE PAVEMENT		EXCAVATION		ELEVATION TARGET			
RIVER / CREEK		ELECTRIC / TELEPHONE POST		ASPHALT CONCRETE PAVEMENT		RETAINING WALL		CONTOUR			
SHORE LINE		CHURCH / SCHOOL		ORIGINAL GROUND		RIPRAP		SECTION IN WATER			
WATER LINE		GOVERNMENT BUILDING		BAMBOO FENCE		GUARDRAIL ON PLAN		SECTION IN EARTH			
ROAD		CONCRETE BUILDING (3 STOREY)		RIPRAP		TRANSVERSE DIRECTION OF FLOW		TEST PIT			
BRIDGE		CYCLONE FENCE				ROAD RIGHT OF WAY		AUGER HOLE			



REPUBLIC OF THE PHILIPPINES
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REPAIR AND REHABILITATION OF ROAD NETWORKS WITH
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EMPLOYEES AND STUDENTS AND THOSE WITH SPECIAL
NEEDS (PHASE 1)
TARLAC AGRICULTURAL UNIVERSITY
PROVINCE OF TARLAC

SYMBOLS / LEGENDS

PREPARED & ENCODED:

JULIE ANN S. DAVID
ENGINEER II

REVIEWED:

CARINA C. SAZO
CHIEF, BRIDGE & OTHER PUBLIC WORKS
DESIGN SECTION
DATE:

SUBMITTED:

ARTHUR Q. SANTOS
CHIEF, PLANNING AND DESIGN DIVISION
DATE:

RECOMMENDED:

MELQUIADES H. STO. DOMINGO
ASSISTANT REGIONAL DIRECTOR
DATE:

APPROVED:

ROSELLER A. TOLENTINO
REGIONAL DIRECTOR
DATE:

CONCURRED:

SILVERIO M. SALASANSON, DSA
UNIVERSITY PRESIDENT
TARLAC AGRICULTURAL UNIVERSITY
DATE:

SET NO.

TARLAC
2024

SHEET NO.

10
35

2400 (8 ft.)



COMMISSION ON AUDIT

(PROVINCE AND CITY)

Project: _____

Location: _____

Implementing Agency: _____

Development Partner: _____

Contractor/Supplier: _____

Brief Description of Project: _____

Project Details: _____

Cost: _____

Fund Source: _____

Project Date			Project Status				Remarks
Duration	Started	Target Date of Completion	Percentage of Completion	As of (Date)	Cost Incurred to Date	Date Completed	

For Particulars or complaints about this project, please contact the Regional Office or Cluster which has audit jurisdiction on this project.

COA Regional Office No./Cluster: _____

Address: _____

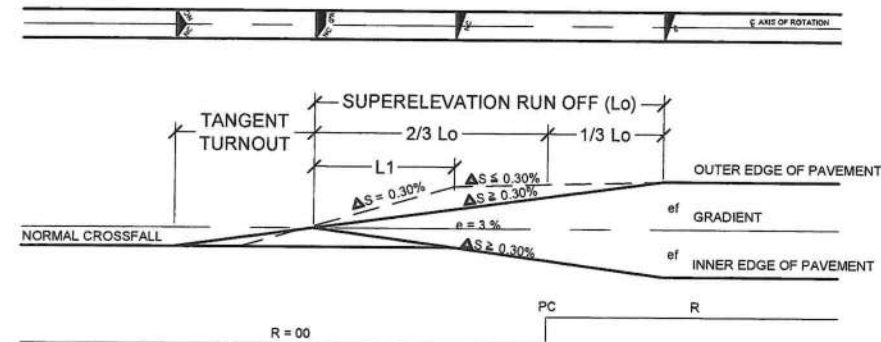
Contact No.: _____ or Text COA Citizen's Desk at 0915-539-1957

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HELVETICA 3"

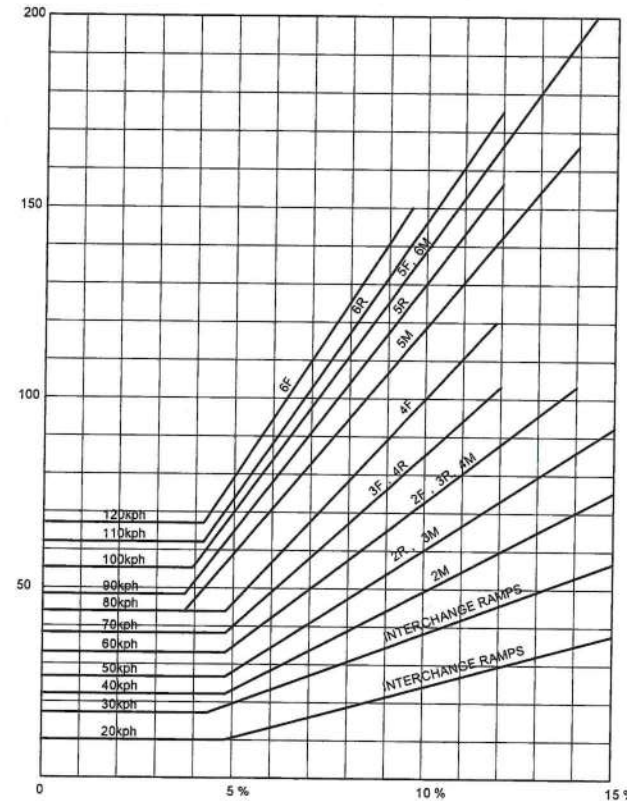
FONT STYLE
HELVETICA 1"

FONT STYLE
HELVETICA 1"

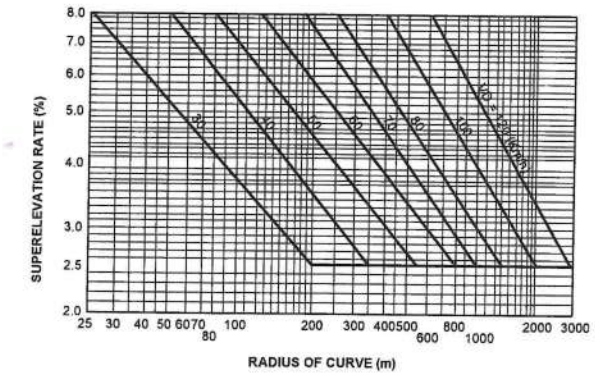
WHITE BACKGROUND
BLACK TEXT



CASE - 1
TRANSITION : STRAIGHT CIRCULAR CURVE



SUPERELEVATION RUN-OFF CHART (Lo)



DESIGN SUPERELEVATION RATES

LEGEND :

- ΔS - SLOPE OF EDGE OF PAVEMENT IN %
- Lo - SUPERELEVATION RUN - OFF
- ef - FULL SUPERELEVATION
- L1-L2 - LENGTH BETWEEN SUPERELEVATION 0% & 2% WITH ΔS = 0.30%
- NC - NORMAL CROSSFALL

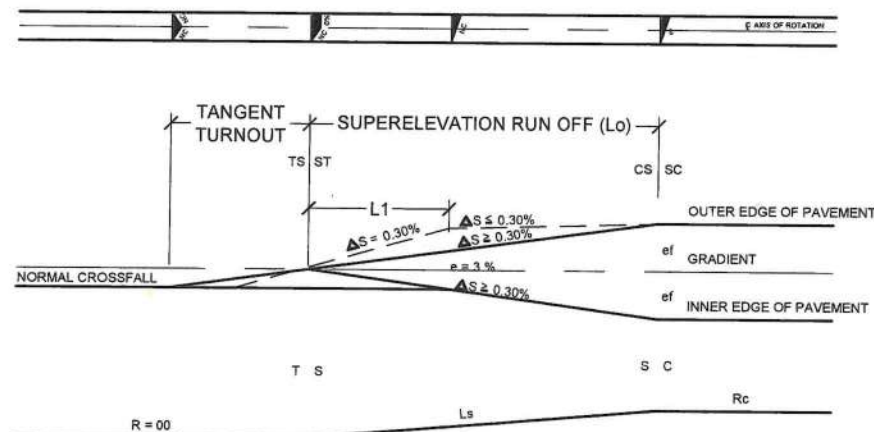
NOTES :

1. FOR EFFECTIVE DRAINAGE ΔS HAS TO BE ΔS ≥ 0.30% BETWEEN ± 3%
2. WHERE ΔS < 0.30%, Δ SPECIAL METHOD OF TRANSITION HAS TO BE ADOPTED AS INDICATED IN ADOPTED LINE
3. ROUNDING OFF ONLY NECESSARY IF ΔS < 0.60%

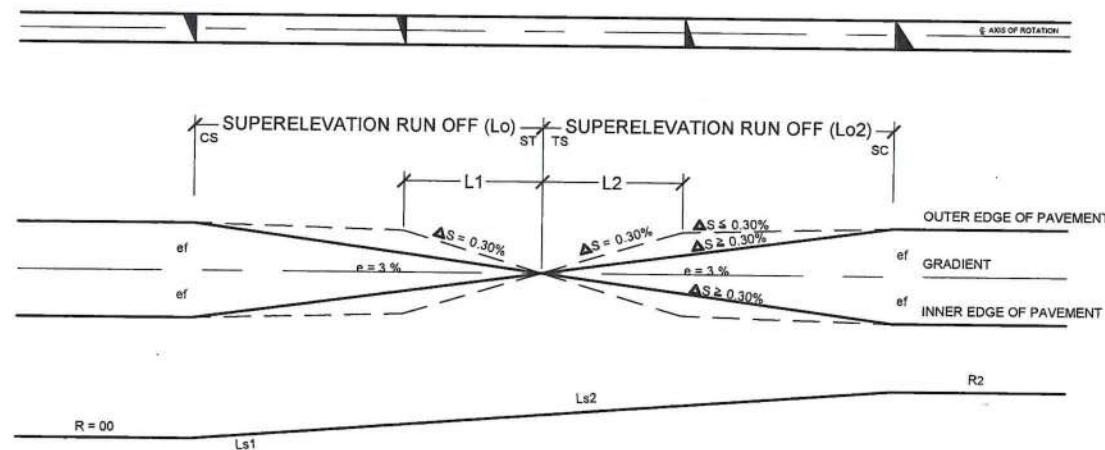
RADII FOR ROUNDING

VD	<80KPH	>80KPH
R	100.00 M.	200.00 M.

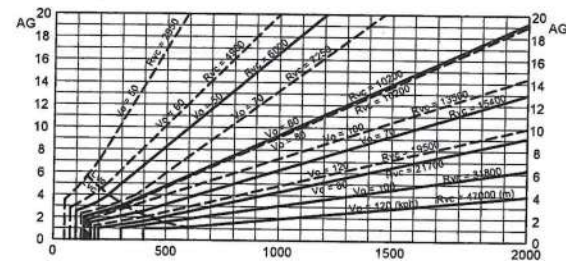
4. ef = e MAX. CAN BE TAKEN FROM CHART FOR SUPERELEVATION ABOVE
5. THE SLOPE SHOULDER SHALL ALWAYS FALL IN THE DIRECTION OF THE OUTSIDE EDGE OF THE TRAVELED WAY.
6. WHEN THE SUPERELEVATION IS LARGER THAN 4% THEN THE SLOPE OF THE LOWER SHOULDER SHALL BE THE SAME AS FOR THE TRAVELED WAY.
7. WHERE THE SUPERELEVATION IS LESS THAN 6% THEN THE HIGHER SHOULDER SHALL HAVE A SLOPE OF 4%.
8. IF THE SUPERELEVATION VARIES 6% TO BE 8% THEN THE SUPERELEVATION OF THE SLOPE OF THE HIGH SHOULDER WILL VARY FROM 4% TO 1 1/2% 1, e THE ALGEBRAIC SHOULD ALWAYS BE EQUAL TO 10%.



CASE - 2
TRANSITION : STRAIGHT - SPIRAL CURVE - CIRCULAR CURVE



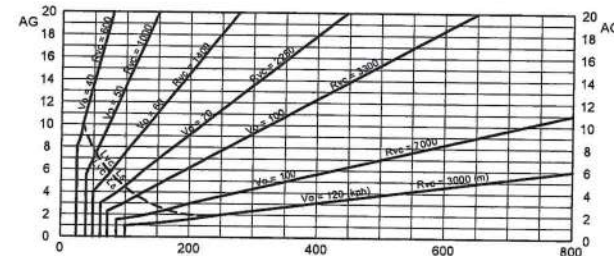
CASE - 3
TRANSITION : CIRCULAR CURVE - REVERSED SPIRAL - CIRCULAR CURVE



HEIGHT OF EYE ABOVE ROADWAY SURFACE = 1.15 M.
 HEIGHT OF OBJECT ABOVE ROADWAY SURFACE = 1.40 M.
 — = REDUCED PASSING SIGHT DISTANCE (LRP)
 - - - = NORMAL PASSING SIGHT DISTANCE (LFP)

$Lvc > S : Lvc = \frac{AGS^2}{400}$ $Lvc > S : Lvc = 2S - \frac{1040}{AG}$

PASSING SIGHT DISTANCE FOR CREST VERTICAL CURVES

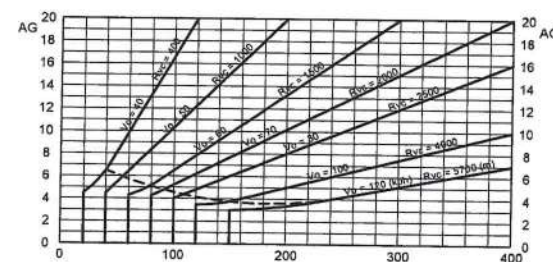


HEIGHT OF EYE ABOVE ROADWAY SURFACE = 1.15 M.
 HEIGHT OF OBJECT ABOVE ROADWAY SURFACE = 0.15 M.

$K = \frac{Lvc}{Ag} = \frac{R}{100}$ $Lvc > S : Lvc = \frac{AGLs^2}{400}$

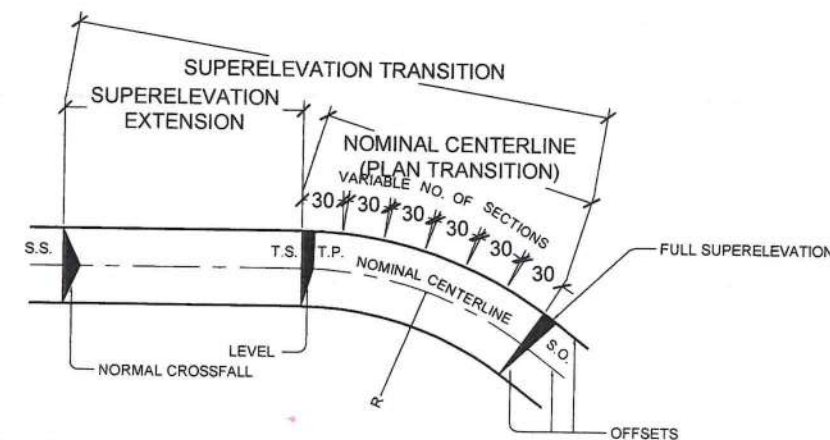
$Lvc < S : Lvc = 2Ls - \frac{400}{Ag}$

STOPPING SIGHT DISTANCE FOR CREST VERTICAL CURVES



$Lvc < Ls : Lvc = \frac{AGLs^2}{120 + 3.5Ls}$ $Lvc < Ls : Lvc = 2Ls - \frac{120 + 3.5Ls}{AG}$

STOPPING SIGHT DISTANCE FOR SAG VERTICAL CURVES



NOTE:
 ALL LONGITUDINAL MEASUREMENTS ARE ALONG THE NOMINAL CENTERLINE. ALL TRANSVERSE MEASUREMENTS ARE AT RIGHT ANGLES TO NOMINAL CENTERLINE.

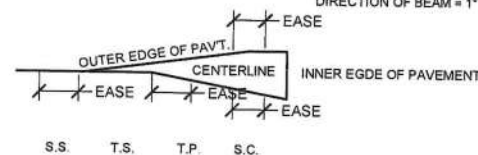
POSITION OF PAVEMENT EDGES AND CENTERLINE IF CURVE WAS NEITHER TRANSITIONED NOR WIDENED

LEGEND:

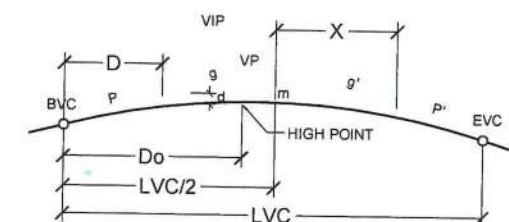
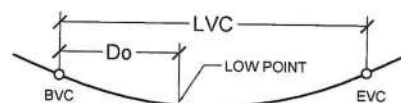
Lvc = LENGTH OF VERTICAL CURVE
 Ls = STOPPING SIGHT DISTANCE
 AG = ALGEBRAIC DIFFERENCE IN GRADES - PERCENT
 S = SIGHT DISTANCE

DESIGN CRITERIA:

HEADLIGHT BEAM DISTANCE IS EQUAL TO STOPPING SIGHT DISTANCE
 HEIGHT OF HEADLIGHT = 0.60 M.
 DIRECTION OF BEAM = 1° UPWARDS



METHOD OF SETTING OUT HORIZONTAL CURVE TRANSITIONS



IN ANY PARABOLIC CURVE:

- $m = \frac{(g - g')(LVC)}{8}$
- $m = \frac{1}{2} \left(\frac{Elev. PVT + Elev. PVT}{2} - Elev. PVI \right)$
- $d = m \left(\frac{D}{LVC/2} \right)^2 = \frac{4m}{LVC^2} D^2$
- $d = \frac{D^2 (g - g')}{2(LVC)}$
- $s = \frac{100(H - P')}{g - g'}$
- $s = g - D \left(\frac{g - g'}{LVC} \right)$
- $Do = \frac{(LVC)g}{g - g'}$

WHERE:

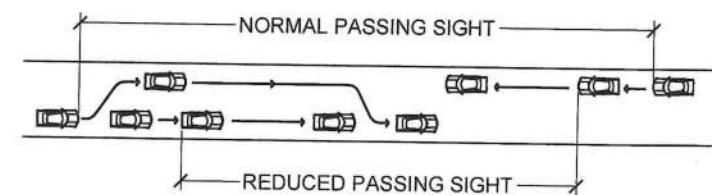
LVC = LENGTH OF CURVE - METERS/100
 g & g' = GRADE RATES - PERCENT
 m = MIDDLE ORDINATES - METERS
 d = CORRECTION FROM GRADE LINE TO CURVE - METERS
 D = DISTANCE FROM PVT TO ANY POINT ON CURVE - METERS/100
 s = SLOPE OF THE TANGENT TO THE CURVE AT ANY POINT - PERCENT
 x = DISTANCE FROM P' TO PVT - METERS
 H = ELEVATION OF GRADE 'g' PRODUCED TO STATION OF P' - METERS
 P & P' = ELEVATION OF PERSPECTIVE GRADES - METERS
 Do = DISTANCE TO LOW OR HIGH POINT FROM EXTREMITY OF CURVE - METERS/100

NOTES:

- A RISING GRADE CARRIES A PLUS SIGN WHILE A FALLING GRADE CARRIES A MINUS SIGN, THUS IN A CREST VERTICAL CURVE AS ABOVE, (g) CARRIES A PLUS SIGN AND (g') A MINUS SIGN WHEN PROGRESSING IN THE OPPOSITE DIRECTION, (g) BECOMES A MINUS GRADE AND (g') A PLUS GRADE.
- NO VERTICAL CURVE IS REQUIRED WHERE THE ALGEBRAIC DIFFERENCE IN GRADES IS 0.50 % OR LESS.

FOR MOST DRIVERS, THE REDUCED PASSING SIGHT DISTANCE IS ADEQUATE FOR OVERTAKING AND HENCE IT IS CONSIDERED RATHER EXTRAVAGANT TO DESIGN ROADS TO FULL PASSING SIGHT DISTANCES ('FULL PASSING SIGHT' IS ALSO TERMED 'NORMAL PASSING SIGHT').

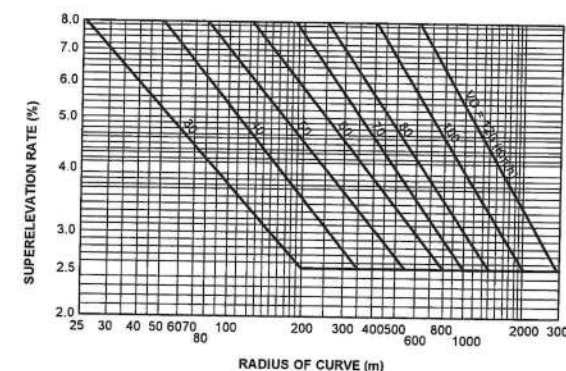
THE DIFFERENCE BETWEEN FULL PASSING SIGHT DISTANCE AND REDUCED PASSING SIGHT DISTANCE IS SHOWN IN THE FOLLOWING FIGURE:



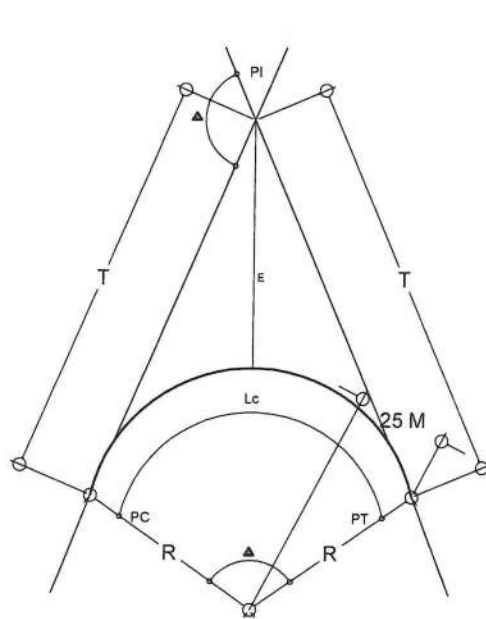
AS GUIDE TO THE EXTENT TO WHICH REDUCED PASSING SIGHT DISTANCE SHOULD BE PROVIDED, THE FOLLOWING TABLE CAN BE USED

DESIGN SPEED (km/h)	MINIMUM PROPORTION OF ROAD WITH REDUCED PASSING SIGHT DISTANCE		
	ADT < 1000	ADT = 1000 - 3000	ADT > 3000
≤ 50	1/5	1/5	1/5
60		1/4	1/3
80		1/4	1/4
100 - 120		1/3	1/2

REDUCED PASSING SIGHT DISTANCE



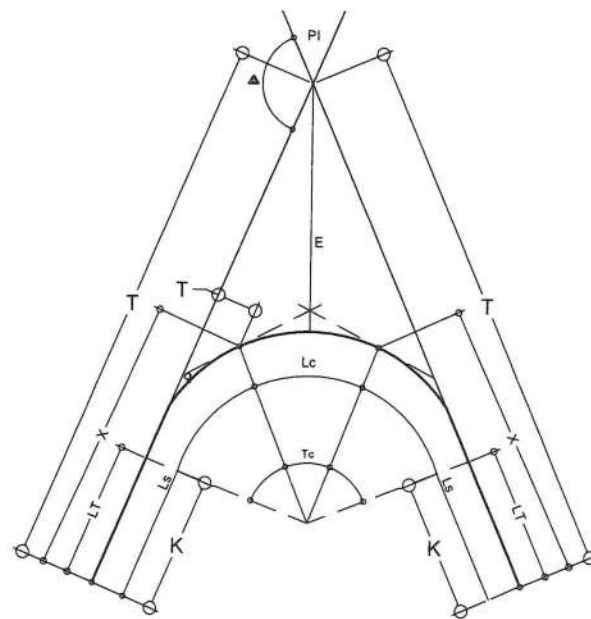
DESIGN SUPERELEVATION RATES



HORIZONTAL CURVE (CIRCULAR)

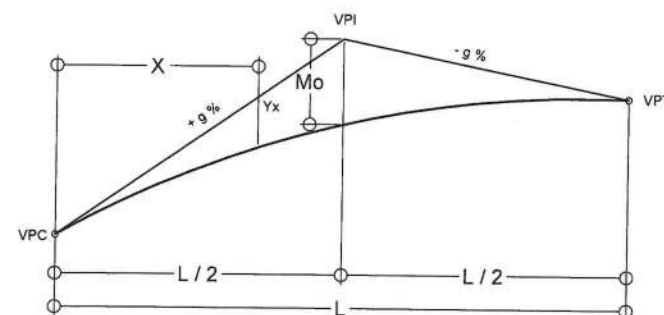
- PI - POINT OF INTERSECTION
 I - INTERSECTION ANGLE (CENTRAL ANGLE)
 T - TOTAL TANGENT DISTANCE
 R - HORIZONTAL RADIUS
 Lc - LENGTH CIRCULAR CURVE
 E - TOTAL EXTERNAL DISTANCE
 D - DEGREE OF CURVE (ARC DEFINITION)
 PC - POINT OF CURVATURE
 PT - POINT OF TANGENCY

I - NO HORIZONTAL CURVE IS REQUIRED WHEN THE INTERSECTION (CENTRAL) ANGLE Δ IS LESS THAN ONE DEGREE ($1^{\circ}-00'$)

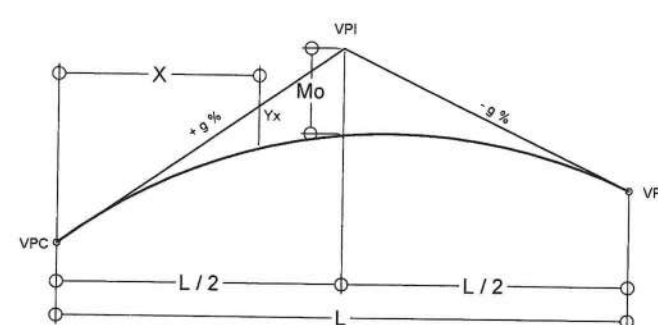


HORIZONTAL CURVE WITH TRANSITION

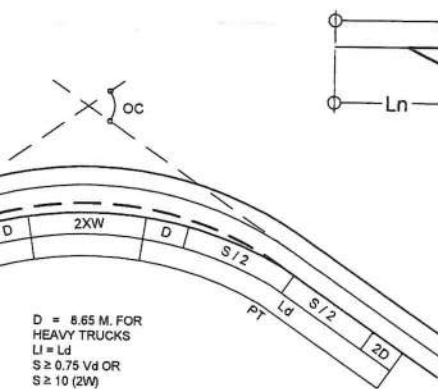
- PI - POINT OF INTERSECTION
 I - INTERSECTION ANGLE
 O - SPIRAL ANGLE
 Ls - LENGTH OF SPIRAL
 XY - COORDINATE OF CS OR SC WITH RESPECT TO MAIN TANGENT
 K - LENGTHENING OF TANGENT DUE TO INTERSECTION OF SPIRAL
 F - OFFSET BETWEEN CIRCULAR CURVE AND MAIN TANGENT
 LT - LONG TANGENT OF SPIRAL
 ST - SHORT TANGENT OF SPIRAL
 Ts - TOTAL TANGENT DISTANCE
 TS - BEGINNING OF SPIRAL CURVE
 SC - POINT OF CHANGE FROM SPIRAL TO CIRCULAR CURVE
 CS - POINT OF CHANGE FROM CIRCULAR CURVE TO SPIRAL
 TS - END OF SPIRAL CURVE
 Ic - ANGLE OF THE CIRCULAR CURVE
 Rc - RADIUS OF THE CIRCULAR CURVE
 Lc - LENGTH OF CIRCULAR CURVE



SYMMETRICAL



UNSYMMETRICAL



WIDENING WHEN TRANSITIONS NOT USED

NOTE:

VALUES LESS THAN 0.60 M. MAY BE DISREGARDED
 VALUES SHOWN BELOW ARE FOR 2 LANE PAVEMENT
 ON CURVES FOR A WIDTH OF 6.10 M. PAVEMENT ON
 TANGENT.

DESIGN VALUES FOR WIDENING ON CURVES

DEGREE OF CURVE	RADIUS IN METERS	DESIGN SPEED	
		40 KPH	65 KPH
1° - 00'	1432.39	0	0
2° - 00'	716.19	0	0.60
3° - 00'	477.46	0	0.60
4° - 00'	358.10	0	0.75
5° - 00'	286.48	0	0.75
6° - 00'	238.73	0.60	0.90
7° - 00'	204.63	0.80	0.90
8° - 00'	179.05	0.90	0.90
9° - 00'	159.15	0.90	1.00
10° - 00'	143.24	0.90	1.00
11° - 00'	130.22		1.00

LEGEND:

- VPI = VERTICAL POINT OF INTERSECTION
 VPC = VERTICAL POINT OF CURVATURE
 VPT = VERTICAL POINT OF TANGENCY
 L = LENGTH OF VERTICAL CURVE IN METERS
 G = GRADE IN PERCENT
 Mo = MIDDLE ORDINATE
 X = DISTANCE FROM VPC OR VPT TO ANY POINT OF CURVE
 A = ALGEBRAIC DIFFERENCE IN GRADES

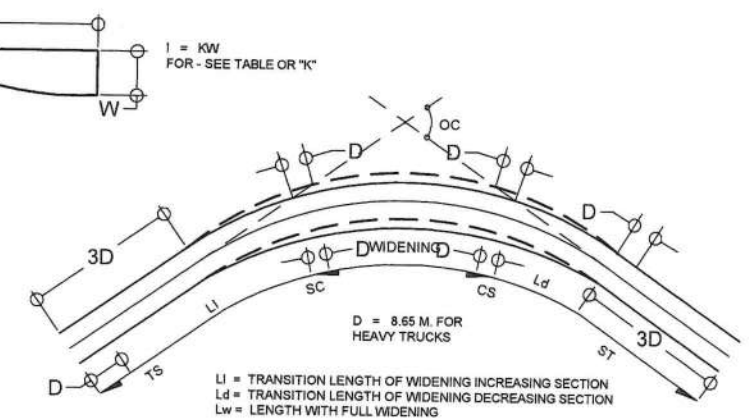
NOTE:

I - NO VERTICAL CURVE IS REQUIRED WHEN THE ALGEBRAIC DIFFERENCE IN GRADES IS LESS THAN 0.50%

IN ANY VERTICAL PARABOLIC CURVE

$$\text{SYMMETRICAL} \quad Mo = \frac{AL}{8.00 (LVC)} \quad Mo = \frac{X^2 (Mo)}{(L/2)^2}$$

$$\text{UNSYMMETRICAL} \quad Mo = \frac{AL_1 L_2}{200 L} \quad Mo = \frac{X^2 (Mo)}{(L_1)^2 \text{ OR } (L_2)^2}$$



WIDENING WHEN TRANSITIONS ARE USED

INCREASING		DECREASING	
Ln / Lx	K	Ln / Lx	K
0.00	0.000	0.00	1.0000
0.02	0.0010	5.0	0.9964
0.04	0.0020	10.0	0.9905
0.06	0.0047	15.0	0.9810
0.08	0.0077	20.0	0.9660
0.10	0.0114	25.0	0.9436
0.12	0.0156	30.0	0.9200
0.14	0.0217	35.0	0.8920
0.16	0.0300	40.0	0.8602
0.18	0.0390	45.0	0.8238
0.20	0.0499	50.0	0.7816
0.22	0.0612	55.0	0.7374
0.24	0.0760	60.0	0.6822
0.26	0.0908	65.0	0.6240
0.28	0.1110	70.0	0.5648
0.30	0.1315	75.0	0.5036
0.32	0.1574	80.0	0.4412
0.34	0.1849	85.0	0.3778
0.36	0.2161	90.0	0.3134
0.38	0.2496	95.0	0.2480
0.40	0.2846	100.0	0.1816
0.42	0.3215	105.0	0.1144
0.44	0.3586	110.0	0.0472
0.46	0.3965	115.0	0.0000
0.48	0.4344	120.0	0.0000
0.50	0.4724	125.0	0.0000
0.52	0.5103	130.0	0.0000
0.54	0.5470	135.0	0.0000
0.56	0.5836	140.0	0.0000
0.58	0.6194	145.0	0.0000
0.60	0.6548	150.0	0.0000
0.62	0.6888	155.0	0.0000
0.64	0.7217	160.0	0.0000
0.66	0.7522	165.0	0.0000
0.68	0.7789	170.0	0.0000
0.70	0.8050	175.0	0.0000
0.72	0.8286	180.0	0.0000
0.74	0.8521	185.0	0.0000
0.76	0.8741	190.0	0.0000
0.78	0.8947	195.0	0.0000
0.80	0.9128	200.0	0.0000
0.82	0.9293	205.0	0.0000
0.84	0.9440	210.0	0.0000
0.86	0.9580	215.0	0.0000
0.88	0.9691	220.0	0.0000
0.90	0.9775	225.0	0.0000
0.92	0.9849	230.0	0.0000
0.94	0.9903	235.0	0.0000
0.96	0.9952	240.0	0.0000
0.98	0.9992	245.0	0.0000
1.00	1.00	250.0	0.0000



REPUBLIC OF THE PHILIPPINES
 DEPARTMENT OF PUBLIC WORKS & HIGHWAYS
 REGIONAL OFFICE NO. 3
 PLANNING AND DESIGN DIVISION
 SINDALAN, CITY OF SAN FERNANDO (P)

C.Y. 2024 PROJECT
 DETAIL ENGINEERING DESIGN PLAN FOR
 STATE UNIVERSITIES AND COLLEGES (SUCs)
 REPAIR AND REHABILITATION OF ROAD NETWORKS WITH
 PROVISION OF WALKABLE PEDESTRIAN PATHWAYS FOR
 EMPLOYEES AND STUDENTS AND THOSE WITH SPECIAL
 NEEDS (PHASE 1)
 TARLAC AGRICULTURAL UNIVERSITY
 PROVINCE OF TARLAC

HORIZONTAL CURVE (CIRCULAR)
 HORIZONTAL CURVE WITH TRANSITION
 WIDENING WHEN TRANSITIONS NOT
 USED, WIDENING WHEN TRANSITIONS
 ARE USED, VERTICAL PARABOLIC
 CURVE

PREPARED & ENCODED:

JULIE ANN S. DAVID
 ENGINEER II

REVIEWED:

CARINA E. GAZO
 CHIEF, BRIDGE AND OTHER PUBLIC WORKS
 DESIGN SECTION

SUBMITTED:

ARTHUR Q. SANTOS
 CHIEF, PLANNING AND DESIGN DIVISION

RECOMMENDED:

MELQUIADES H. SITO, DOMINGO
 ASSISTANT REGIONAL DIRECTOR

APPROVED:

ROSELLER A. TOLENTINO
 REGIONAL DIRECTOR

CONCURRED:

SILVERIO R. GONZALEZ, DBA
 UNIVERSITY PRESIDENT
 TARLAC AGRICULTURAL UNIVERSITY

SET NO.

TARLAC
 2024

SHEET NO.

14
 35

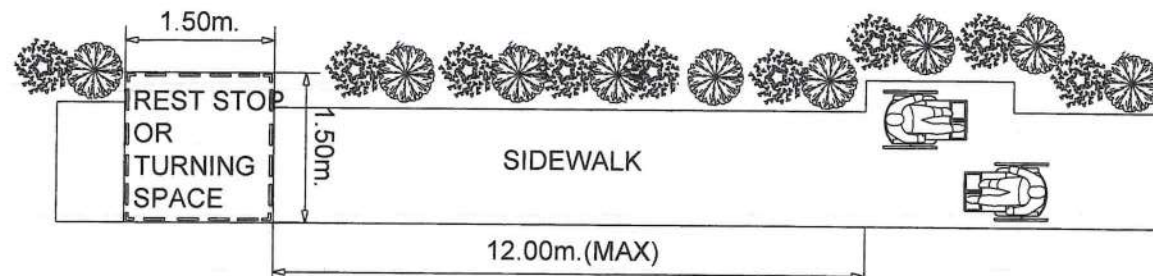


Fig. 3B : Rest Stops On Busy or Lengthy Sidewalks

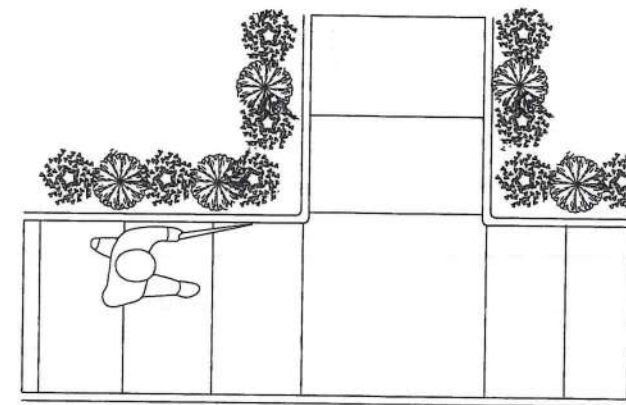


Fig. 3C: Sidewalks To Guide The Blind

KEEP ROUTES AS STRAIGHT AS POSSIBLE WITH RIGHT ANGLE TURNS

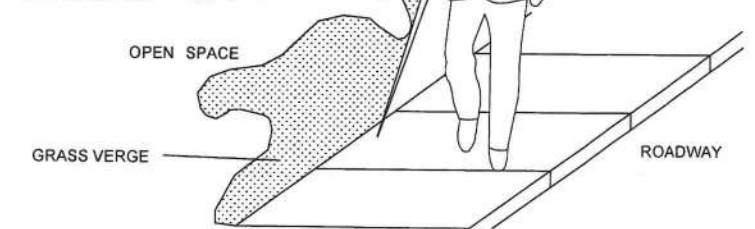


Fig. 3F : Grass Verge Defines Edge of Sidewalks

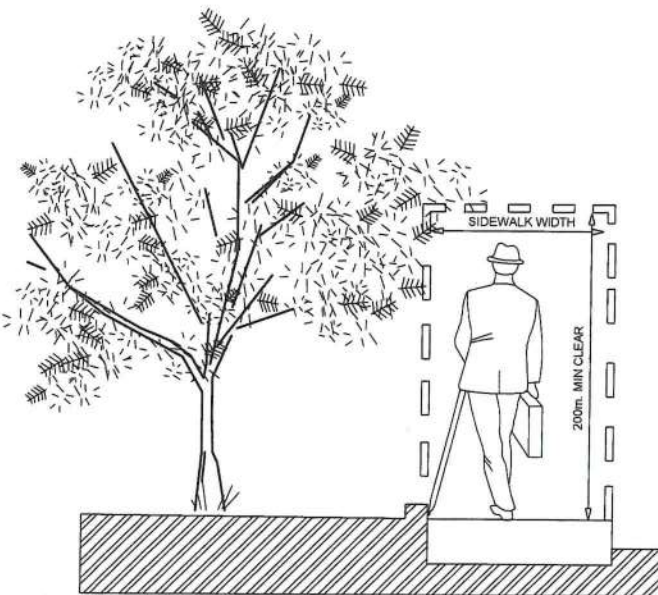


Fig. 3G : Planters Define Back of Sidewalks

OPEN SPACE

PLANTERS

ROADWAY

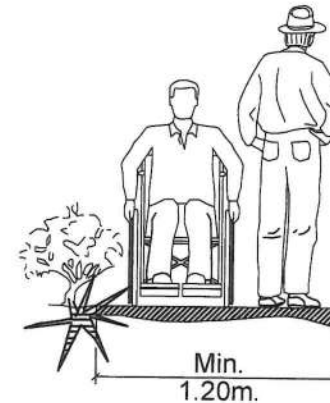


Fig. 3A : Sidewalks

1:100 MAX.
CROSS GRADIENT
ROADWAY SURFACE

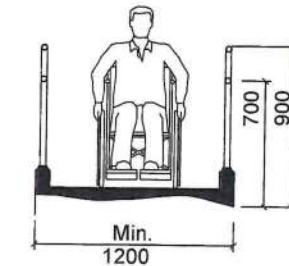
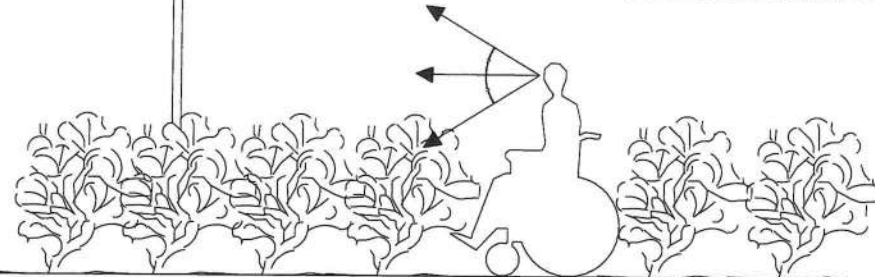
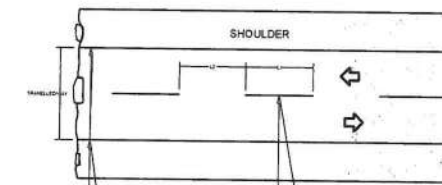


Fig. 3E: handrail Height

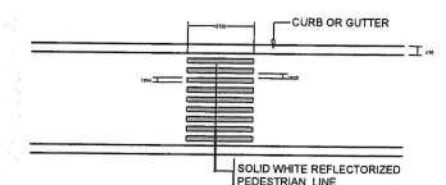
CONVENIENTLY LOCATED
SIGNS: SIMPLE & EASY
TO UNDERSTAND: EASILY
DETECTED
NORMALSIGHTLINES



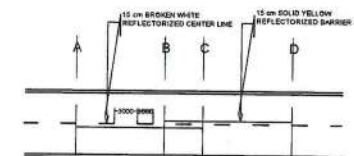
NOTE: THIS PLAN IS FORBIDDING PURPOSES ONLY. PRE-CONSTRUCTION SURVEY SHALL BE CONDUCTED JOINTLY BY THE CONTRACTOR AND THE IMPLEMENTING OFFICE, CORRESPONDING AS STAKED PLANS SHOWING ANY CHANGES FROM APPROVED DETAILED ENGINEERING DESIGN. PLANS SHALL BE PREPARED AND SUBJECT FOR APPROVAL BY DPWH.



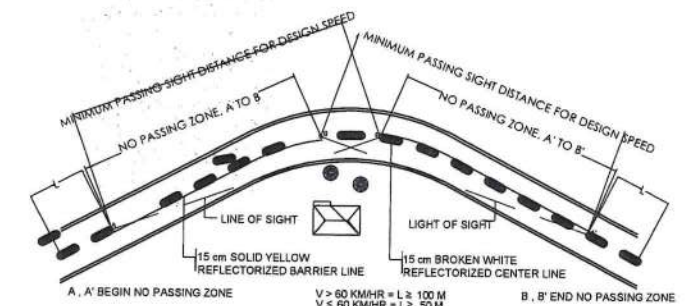
RURAL ROAD - TWO LANE
NOT TO SCALE



PEDESTRIAN CROSSING
NOT TO SCALE



NO PASSING LINES ON VERTICAL CURVES
NOT TO SCALE



NO PASSING LINES ON HORIZONTAL CURVES
NOT TO SCALE

PAVEMENT MARKINGS



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TARLAC AGRICULTURAL UNIVERSITY
PROVINCE OF TARLAC

STANDARD DETAIL FOR BP344
AND PAVEMENT MARKINGS

PREPARED & ENCODED:
JULIE ANN S. DAVID
ENGINEER II

REVIEWED:
CARINA C. GAZO
CHIEF, BRIDGE & OTHER PUBLIC WORKS
DESIGN SECTION
DATE:

SUBMITTED:
ARTHUR Q. SANTOS
CHIEF, PLANNING AND DESIGN DIVISION
DATE:

RECOMMENDED:
MEI QUIADES H. STO. DOMINGO
ASSISTANT REGIONAL DIRECTOR
DATE:

APPROVED:
ROSELLER A. TOLENTINO
REGIONAL DIRECTOR
DATE:

CONCURRED:
SILVERIO P. GONZALEZ, DBA
UNIVERSITY PRESIDENT
TARLAC AGRICULTURAL UNIVERSITY
DATE:

SET NO.

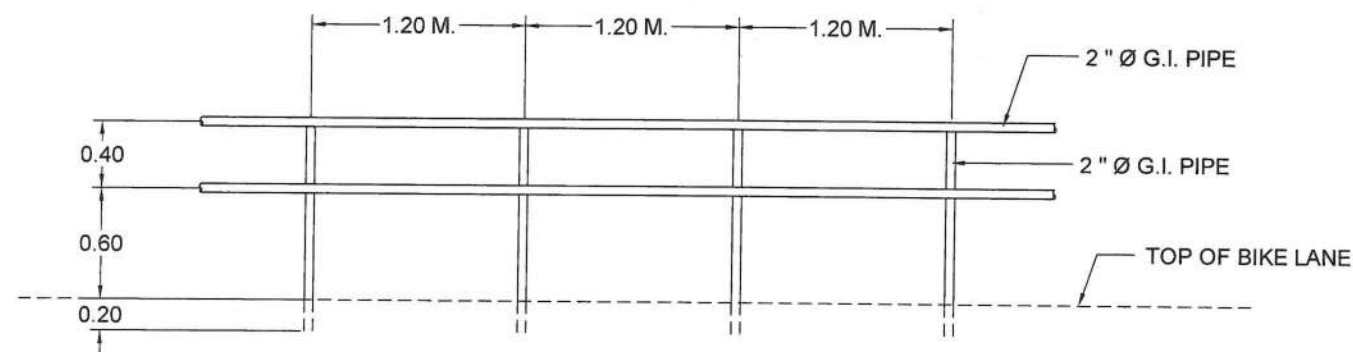
TARLAC

2024

SHEET NO.

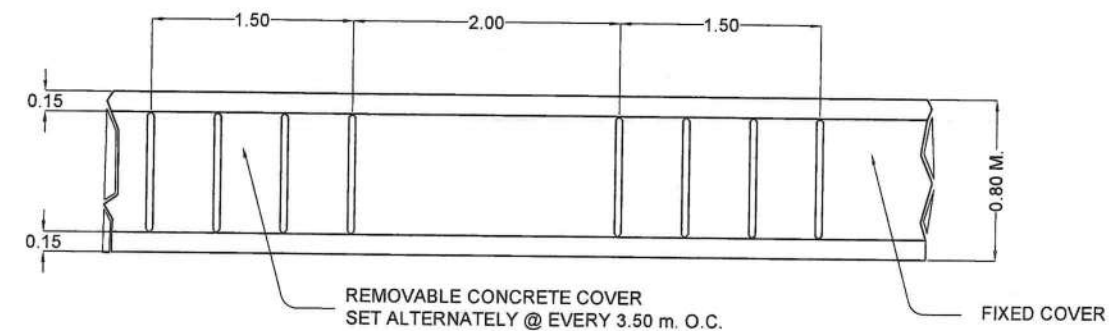
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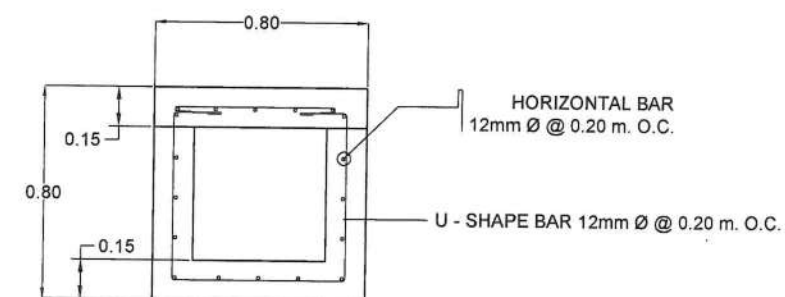


DETAIL OF RAILING

SCALE : 1 : 50 M.

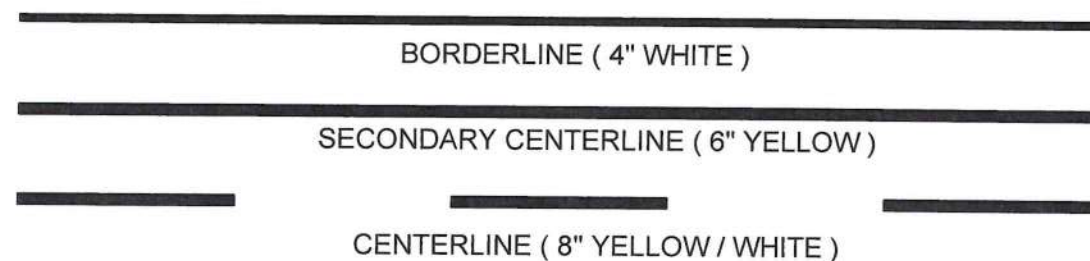


PLAN



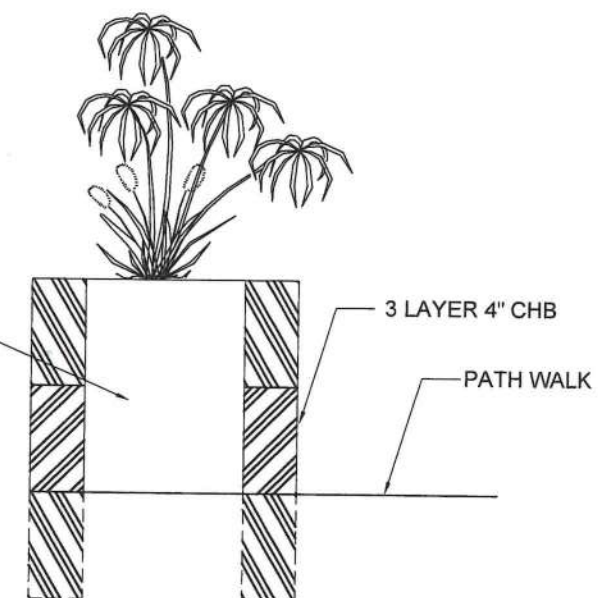
DETAIL OF LINED CANAL

SCALE : 1 : 20 mts.



DETAIL OF REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS

ITEM 804(2)a EMBANKMENT FROM BORROW, COMMON SOIL



DETAIL OF PLANT BOX

SCALE : 1 : 10 mts.



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NEEDS (PHASE 1)
TARLAC AGRICULTURAL UNIVERSITY
PROVINCE OF TARLAC

MISCELLANEOUS DETAIL

PREPARED & ENCODED :

JULIE ANN S. DAVID
ENGINEER II

REVIEWED :

CARINA C. GAZO
CHIEF, BRIDGE & OTHER PUBLIC WORKS
DESIGN SECTION

SUBMITTED :

ARTHUR Q. SANTOS
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RECOMMENDED :

MELQUIADES H. STO. DOMINGO
ASSISTANT REGIONAL DIRECTOR

APPROVED :

ROSELLER A. TOLENTINO
REGIONAL DIRECTOR

CONCURRED :

SILVERIO T. GARCIA, DBA
UNIVERSITY PRESIDENT
TARLAC AGRICULTURAL UNIVERSITY

SET NO.

TARLAC
2024

SHEET NO.

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SCHEDULE OF REINFORCEMENTS

BAR BENDING DIAGRAM	BAR MARK	SIZE (mm)	SPACING (mm)	QUANTITY	BAR SHAPE	BAR DIMENSIONS (mm)				BAR LENGTH (m)	TOTAL LENGTH (m)	UNIT WEIGHT (kg/m)	TOTAL WEIGHT (kg)	VOLUME (m³)
a	b	c	d	e	f	a	b	c	d	e	f	g	h	i
1	10	150	5	2	A	1750	1700	100	-	7.10	35.50	0.616	21.87	2.80
2	10	150	6	2	B	2310	1700	2700	-	6.71	40.26	0.616	24.80	
3	10	150	12	2	C	2510	400	200	-	3.11	37.32	0.616	22.98	
4	10	150	12	2	D	2000	2000	1700	-	5.70	68.40	0.616	42.13	
5	10	150	8	2	E	1800	-	-	-	1.80	14.40	0.616	8.87	
6	10	150	7	2	F	1700	1800	800	-	6.50	45.50	0.616	28.03	
7	10	150	6	2	G	1200	-	-	-	1.20	7.20	0.616	4.44	
8	10	150	6	2	H	2310	1700	800	-	4.81	28.86	0.616	17.78	
											TOTAL		170.91	2.80
											SAY		171	2.80

GENERAL NOTES

SPECIFICATIONS :

DESIGN 1977 AASHTO SPECIFICATION FOR HIGHWAYS AND BRIDGES.

CONCRETE :

ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS (f_c = 3000 PSI)

ALL EXPOSED CORNERS TO BE CHAMFERED 0.019 m. NO CONSTRUCTION JOINTS ARE TO BE

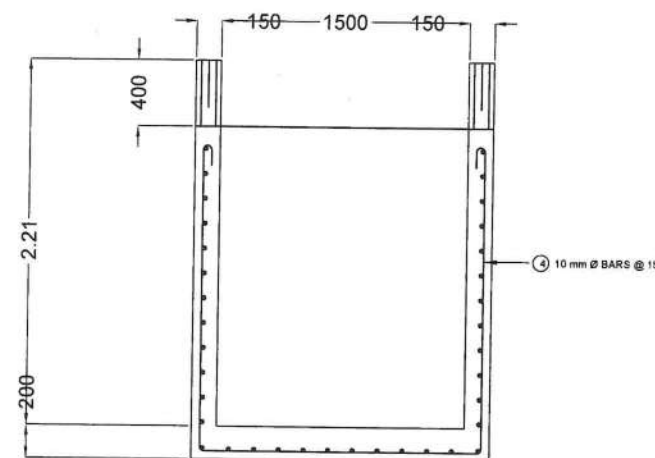
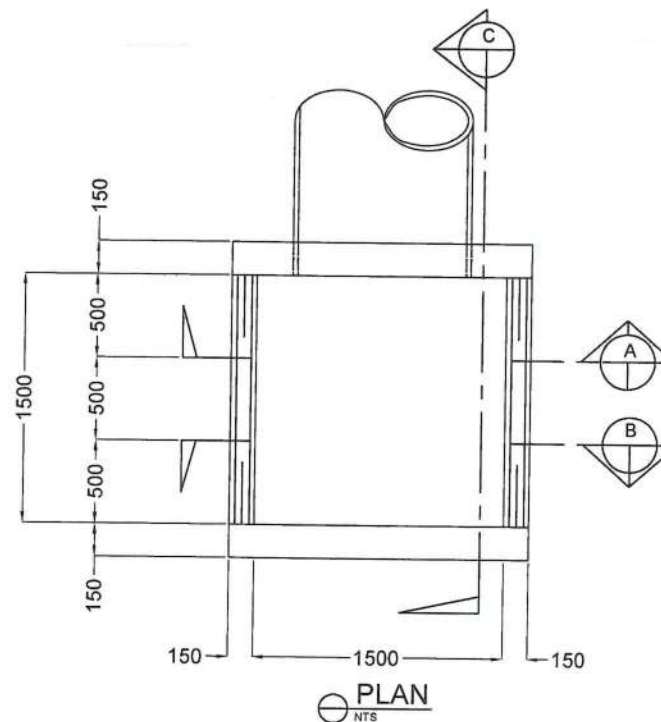
MADE EXCEPT WHERE SHOWN WHEN BOTTOM SLAB IS SUBJECT TO ABRASION, ADD 0.025 m.

TO BOTTOM SLAB TO INCREASE COVERAGE ON STEEL.

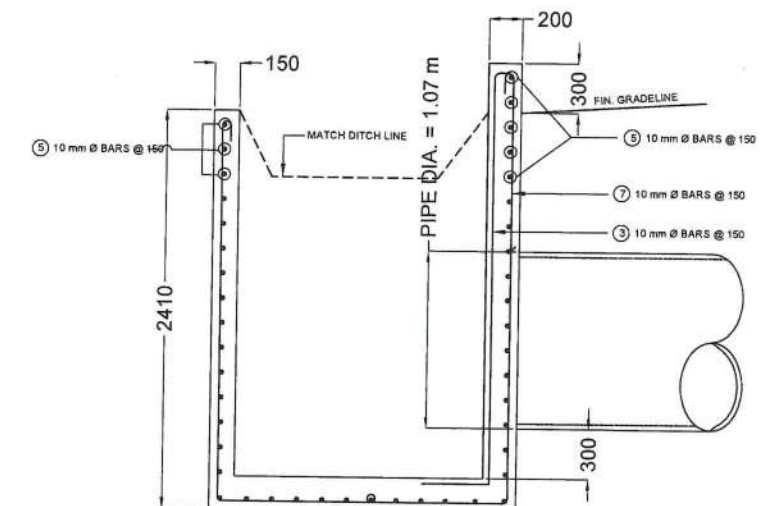
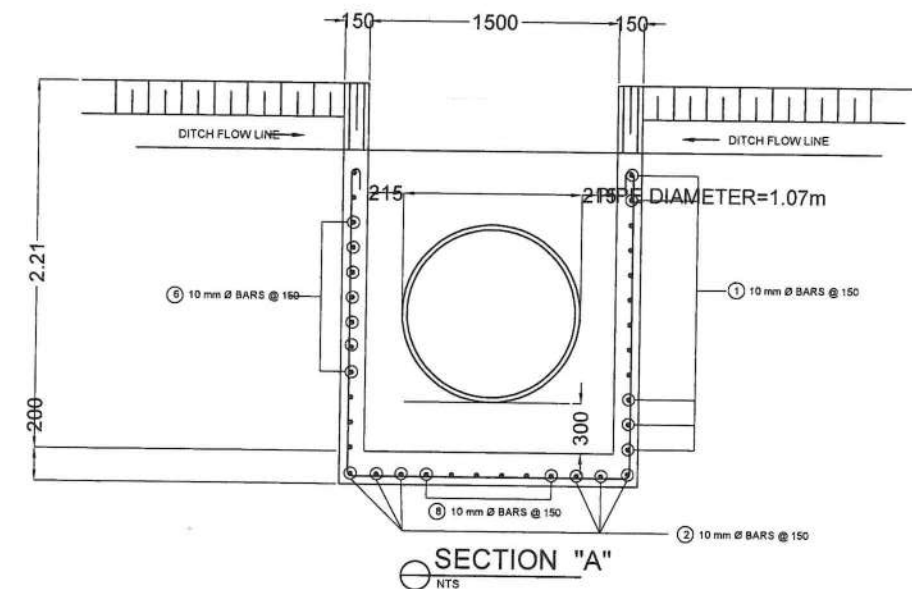
STEEL REINFORCEMENT :

ALL REINFORCING STEEL TO BE INTERMEDIATE GRADE (GRADE 40), ASTM A 615 WITH

DEFORMATION CONFORMING TO ASTM A - 305 - 49 (f_y = 40000 PSI).



SECTION "B"



SECTION "C"

CONCRETE CATCH BASIN

SCALE AS SHOWN



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TARLAC AGRICULTURAL UNIVERSITY
PROVINCE OF TARLAC

DETAIL OF STANDARD
CATCH BASIN

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SUBMITTED
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DATE:

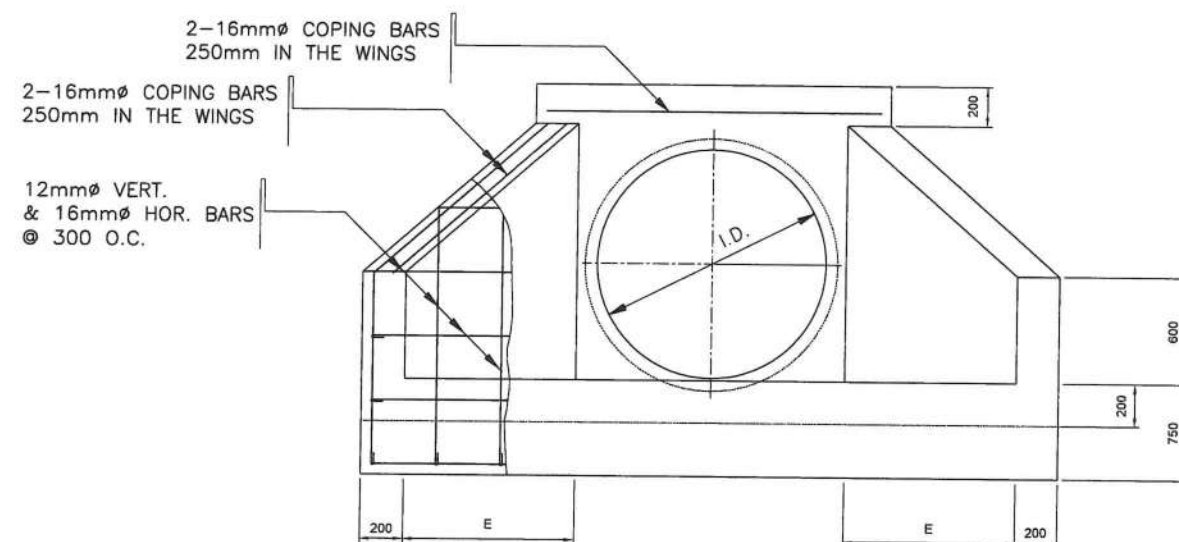
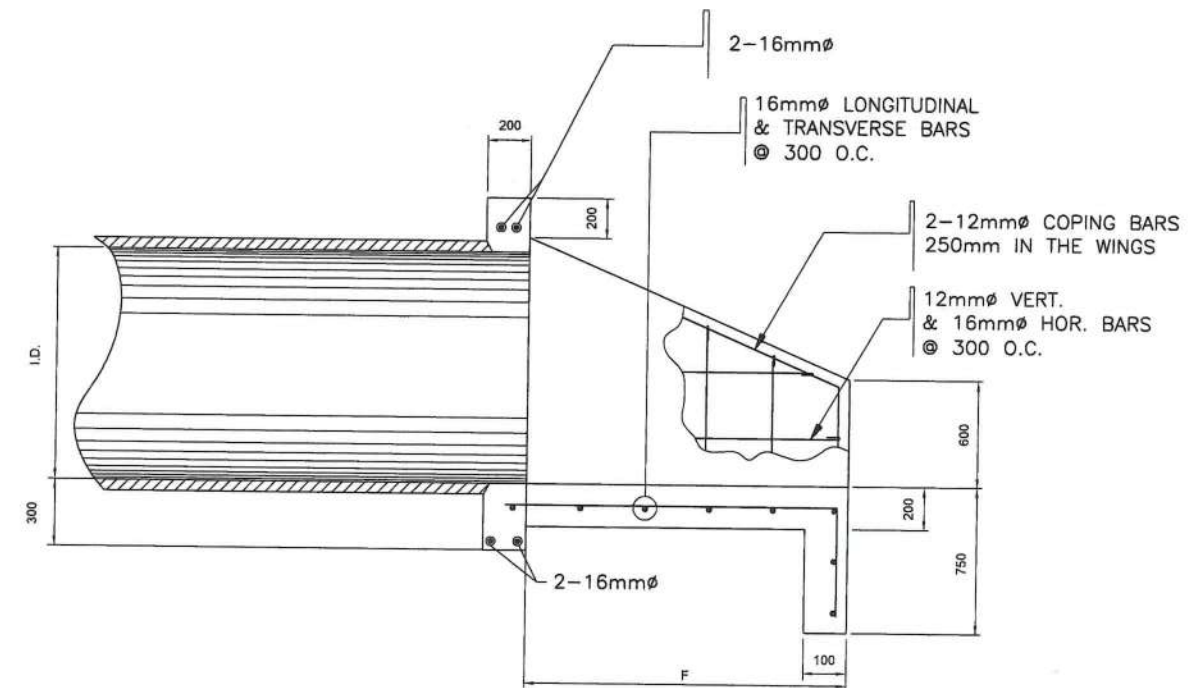
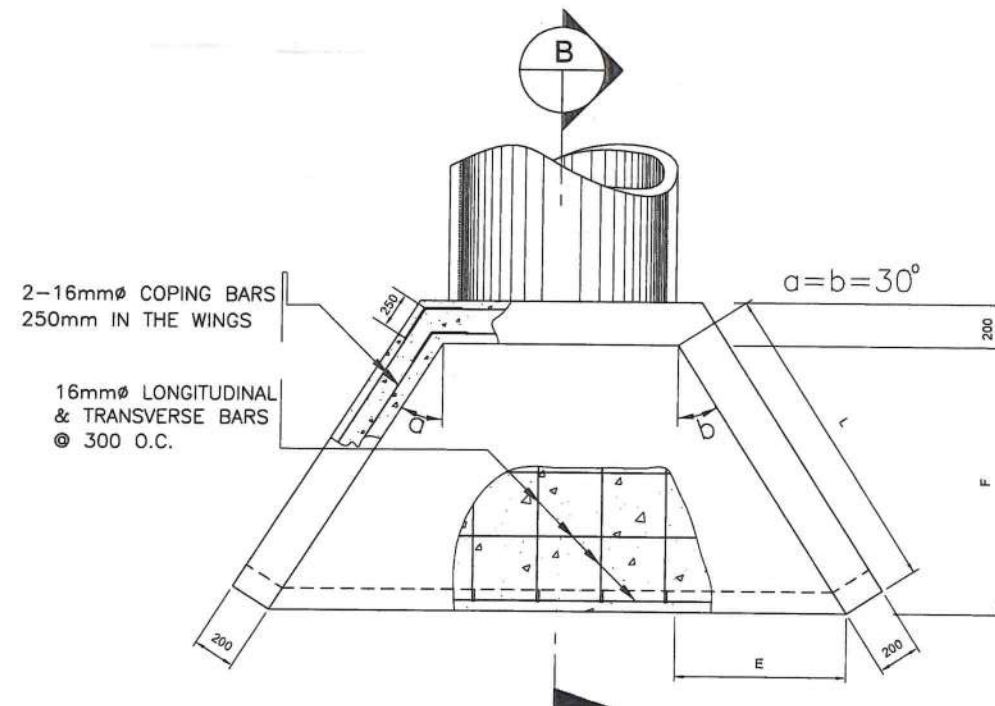
RECOMMENDED
MELOQUIADES H. SITO DOMINGO
ASSISTANT REGIONAL DIRECTOR
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ROSELLER A. TOLENTINO
REGIONAL DIRECTOR
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SILVERIO R. RIVERA, DEAN
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TARLAC AGRICULTURAL UNIVERSITY
DATE:

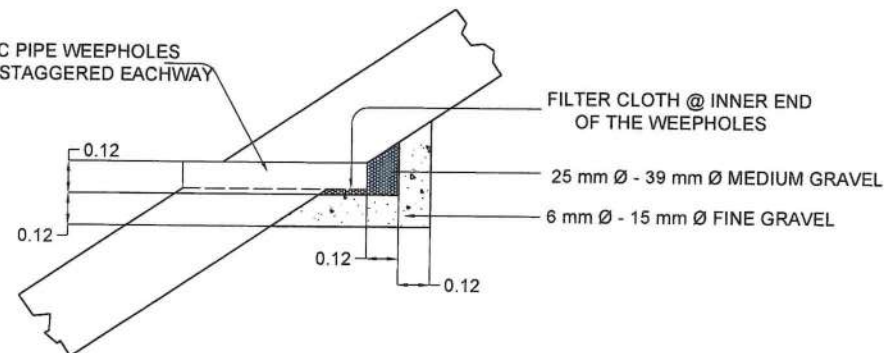
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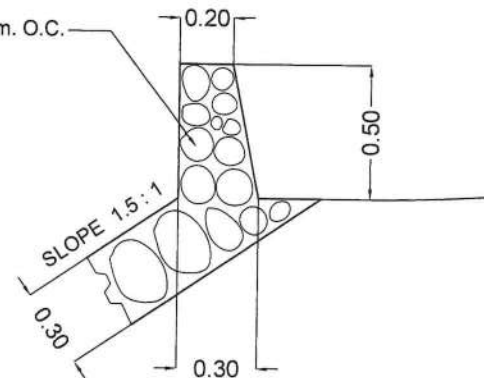
FLARED "F" TYPE HEADWALL FOR 1.07m. to 1.52m. PIPES (1.5:1.0 SLOPES)													
DIA. & THK. OF PIPE (mm)			DIMENSIONS (mm)			SINGLE PIPE				DOUBLE PIPE			
INT. DIA. I.D. (D) (mm)	MIN. THK SHELL 't'		L	E	F	AREA OF WATERWAY (sq.m.)	W (mm.)	FLARED TYPE		AREA OF WATERWAY (sq.m.)	W (mm.)	FLARED TYPE	
	MACHINE MADE	HAND MADE						CONC (cu.m.)	STEEL (kg.)			CONC (cu.m.)	STEEL (kg.)
1070	90		1100	610	910	0.70	1220	1.45	61.22	1.40	3000	2.41	97.50
1220	110		1370	760	1140	0.91	1370	1.88	83.45	1.83	3400	3.10	130.61
1520	130		1920	1070	1600	1.43	1680	2.86	133.79	2.86	4220	4.71	200.45

100 mm Ø PVC PIPE WEEPHOLES
@ 2.00 m. O.C. STAGGERED EACHWAY



SPOT DETAIL
SCALE: 1:20 M.

LENGTH = 1.00 m. @ 2.00 m. O.C.

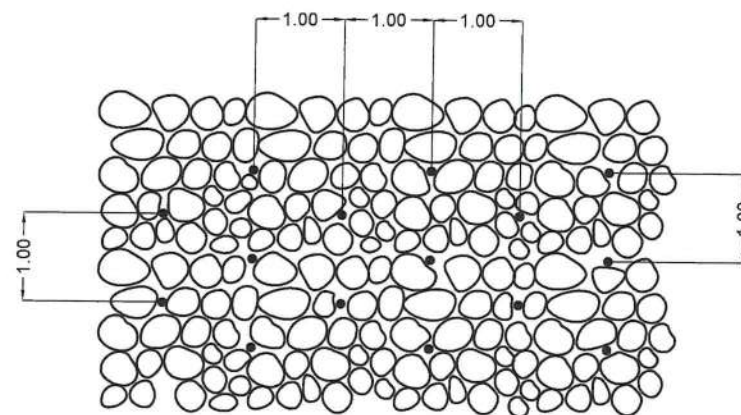


DETAIL 'A'
SCALE: 1:20 M.

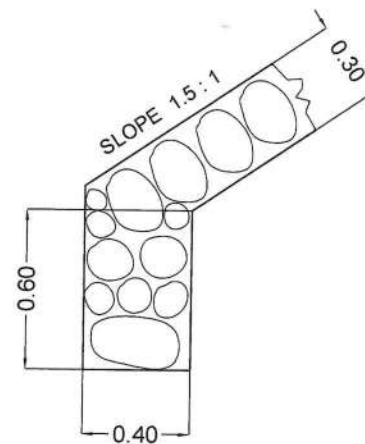
NOTE:

THE COST OF FINE / MEDIUM GRAVEL WEEPHOLES,
FILTER CLOTH (BURLAP CLOTH) USED FOR THE WEEPHOLES
SHALL BE CONSIDERED SUBSIDIARY TO COMPLETION OF
PAY ITEM WHERE IT IS USE.

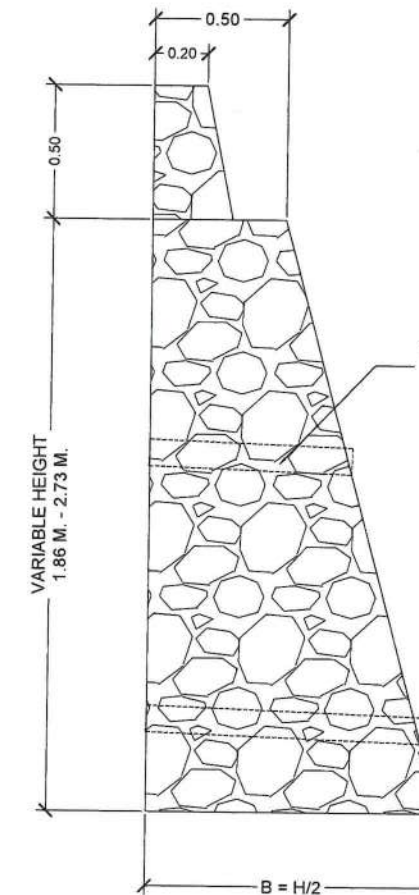
ALL WEEPHOLES SHALL HAVE A SLOPE OF 0.50 %.



PARTIAL ELEVATION OF WEEPHOLES
SCALE: 1:20 M.



DETAIL 'B'
SCALE: 1:20 M.



4" Ø WHEEPHOLE (PVC PIPE) @ 2.00 m. O.C.
HORIZONTAL & VERTICAL STAGGERED

DETAIL OF STONE MASONRY WALL
SCALE: 1:20 M.



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**DETAIL OF GROUTED RIPRAP
& STONE MASONRY**

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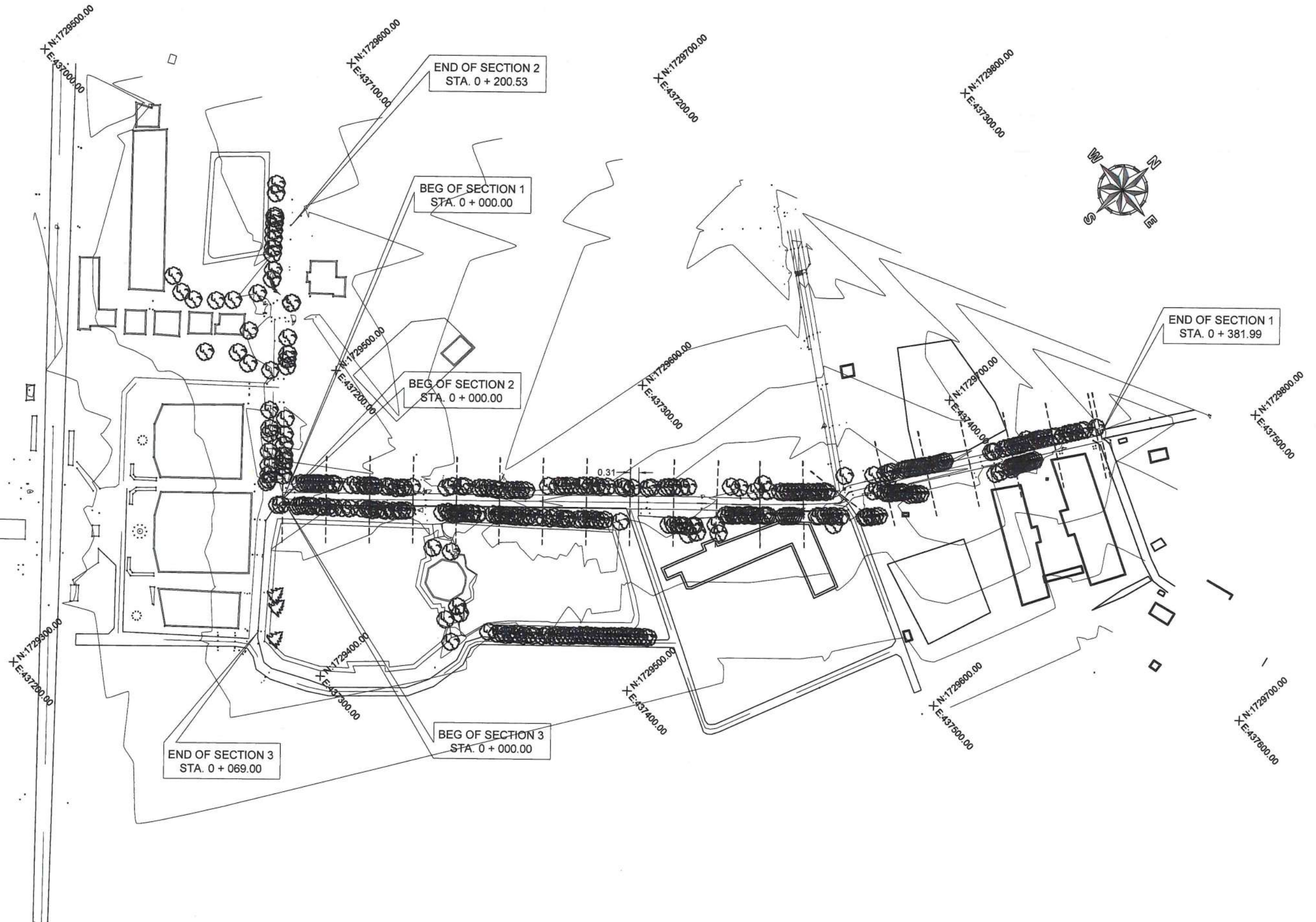
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PLAN

PREPARED & ENCODED:

Julie Ann S. David
JULIE ANN S. DAVID
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CARINA C. GAZO
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Arthur Q. Santos
ARTHUR Q. SANTOS
 CHIEF, PLANNING AND DESIGN DIVISION
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RECOMMENDED:

Melquiades H. Sto. Domingo
MELQUIADES H. STO. DOMINGO
 ASSISTANT REGIONAL DIRECTOR
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APPROVED:

Roseller A. Tolentino
ROSELLER A. TOLENTINO
 REGIONAL DIRECTOR
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CONCURRED:

Silverio R. Tolentino, DSA
SILVERIO R. TOLENTINO, DSA
 UNIVERSITY PRESIDENT
 TARLAC AGRICULTURAL UNIVERSITY
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PLAN AND PROFILE :
SCALE : HOR. 1 : 1250 M.
VER. 1 : 250 M.

ELEV. = 72.00 M.

FOLLOW EXISTING GRADE LINE

g = 0% (LEVEL)

STATION

0 + 000

0 + 100

0 + 200

0 + 300

0 + 400

FINISHED GRADE ELEVATION

FOLLOW EXISTING GRADE LINE

EXISTING GRADE ELEVATION

72.17

71.83

71.53

71.41

71.26

71.06

71.02

71.21

71.40

71.72

72.02

72.11

72.12

71.99

71.47

71.47

71.47

71.47

71.87

72.54

72.67

PREPARED & ENCODED :

REVIEWED :

SUBMITTED :

RECOMMENDED :

APPROVED :

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PROFILE

JULIE ANN S. DAVID
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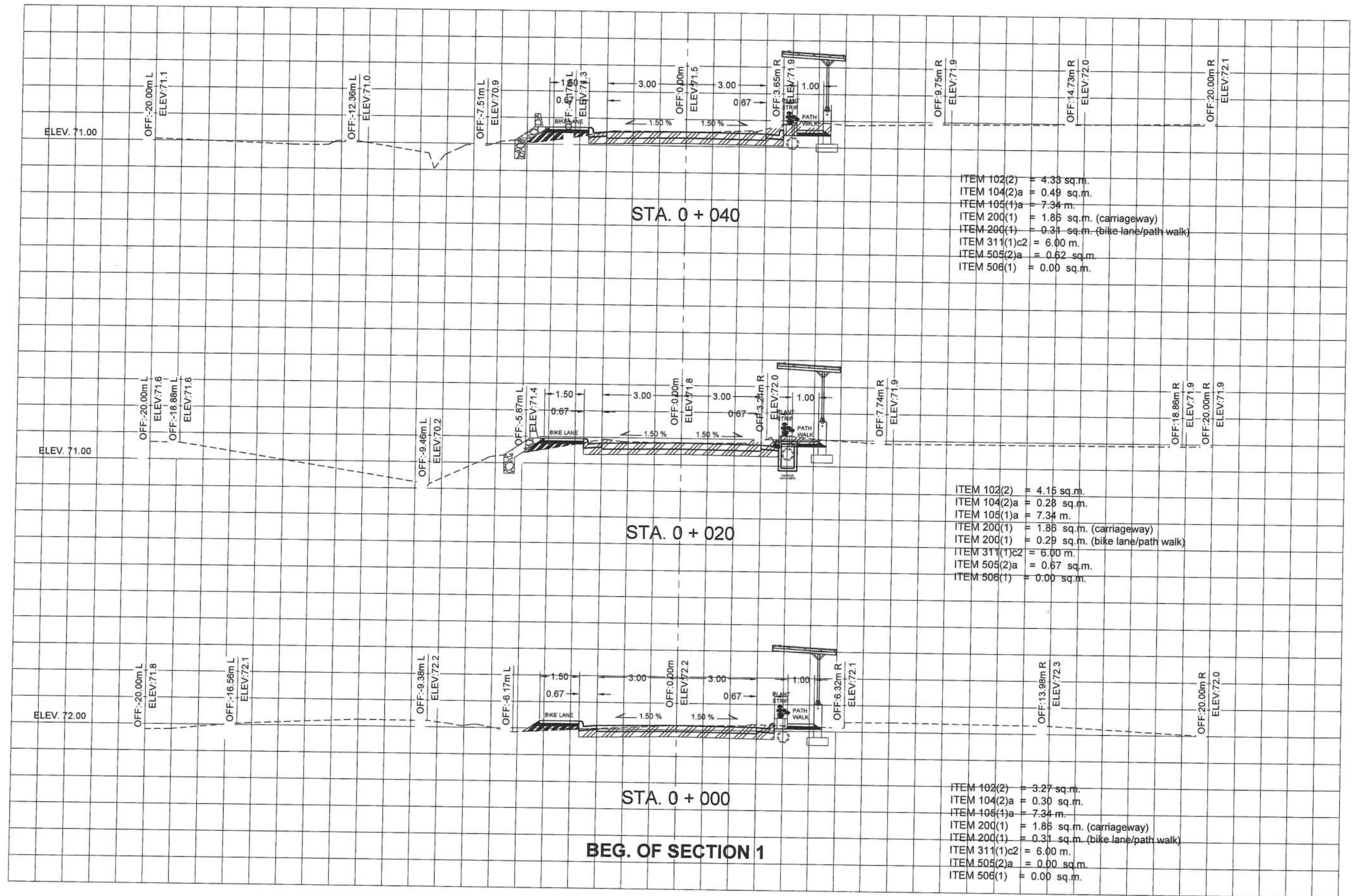
MELQUIADES H. STO. DOMINGO
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ROSELLER A. TOLENTINO
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UNIVERSITY PRESIDENT
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PROVINCE OF TARLAC

CROSS SECTIONS

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JULIE ANN S. DAVID
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CARINA D. GAZO
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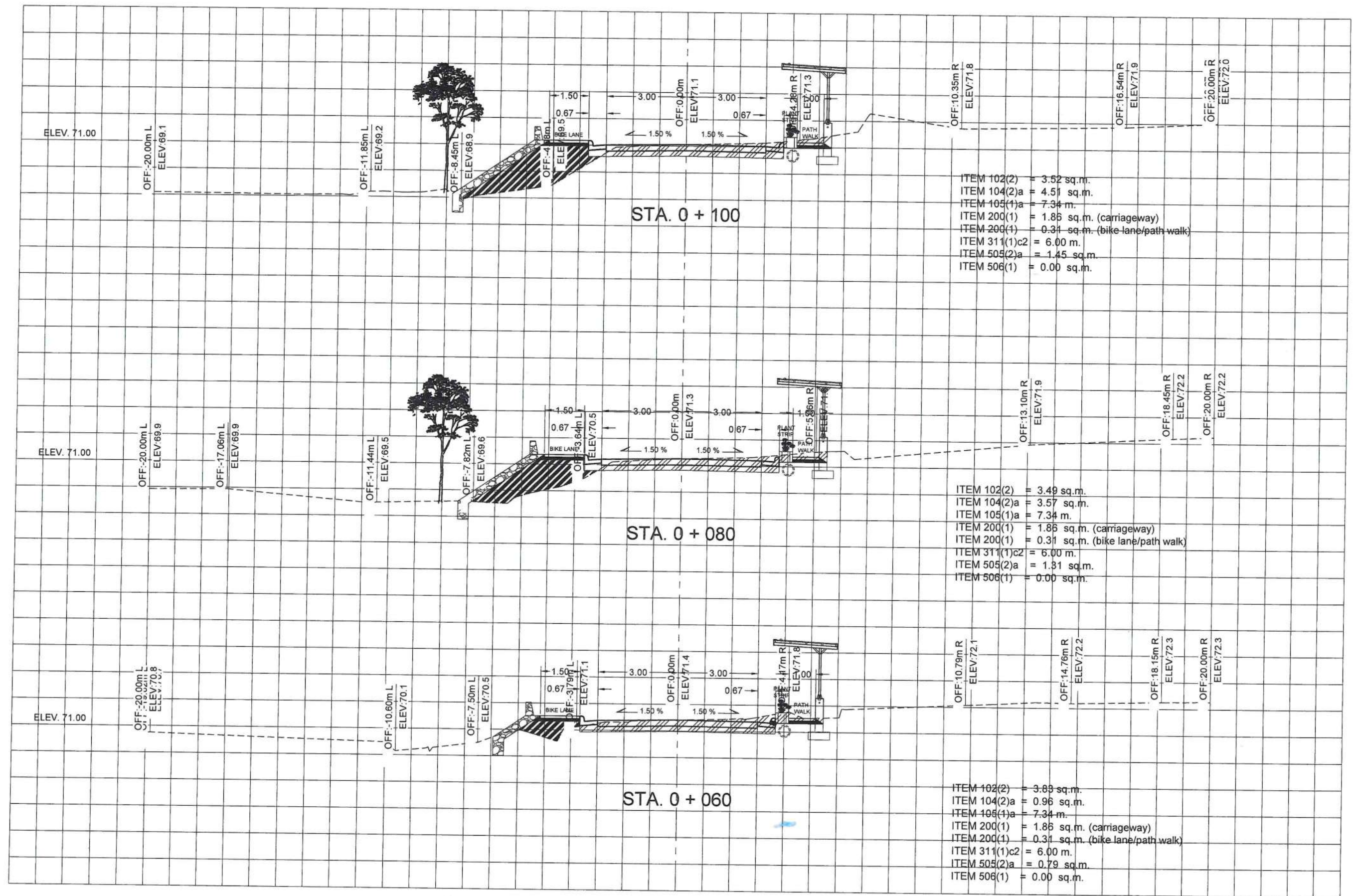
SUBMITTED:
ARTHUR Q. SANTOS
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DATE:

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2024 35



REPUBLIC OF THE PHILIPPINES
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 REGIONAL DIRECTOR
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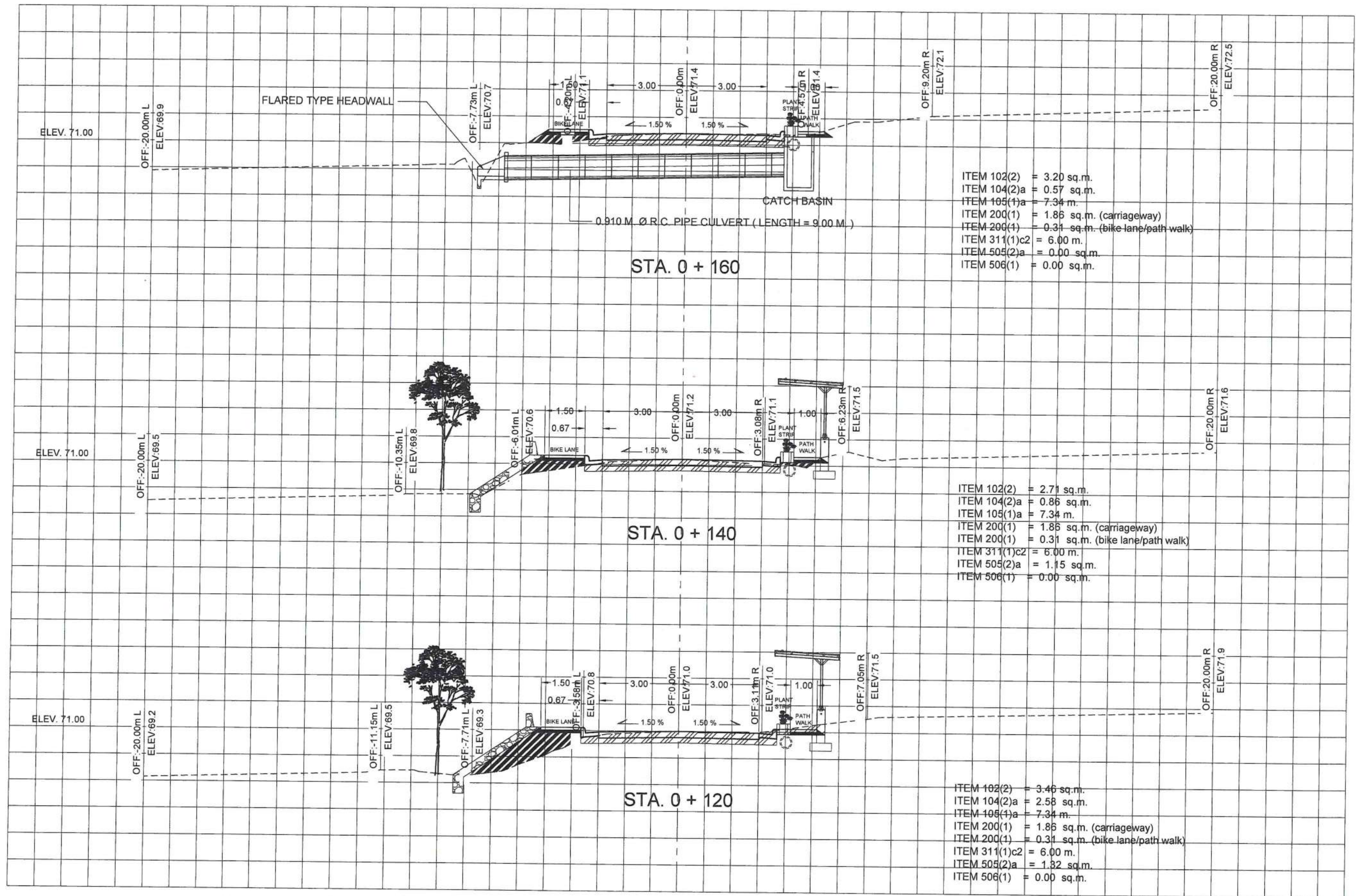
SILVERIO R. GONZALEZ, DBA
 UNIVERSITY PRESIDENT
 TARLAC AGRICULTURAL UNIVERSITY
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REGIONAL DIRECTOR
DATE:

CONCURRED:

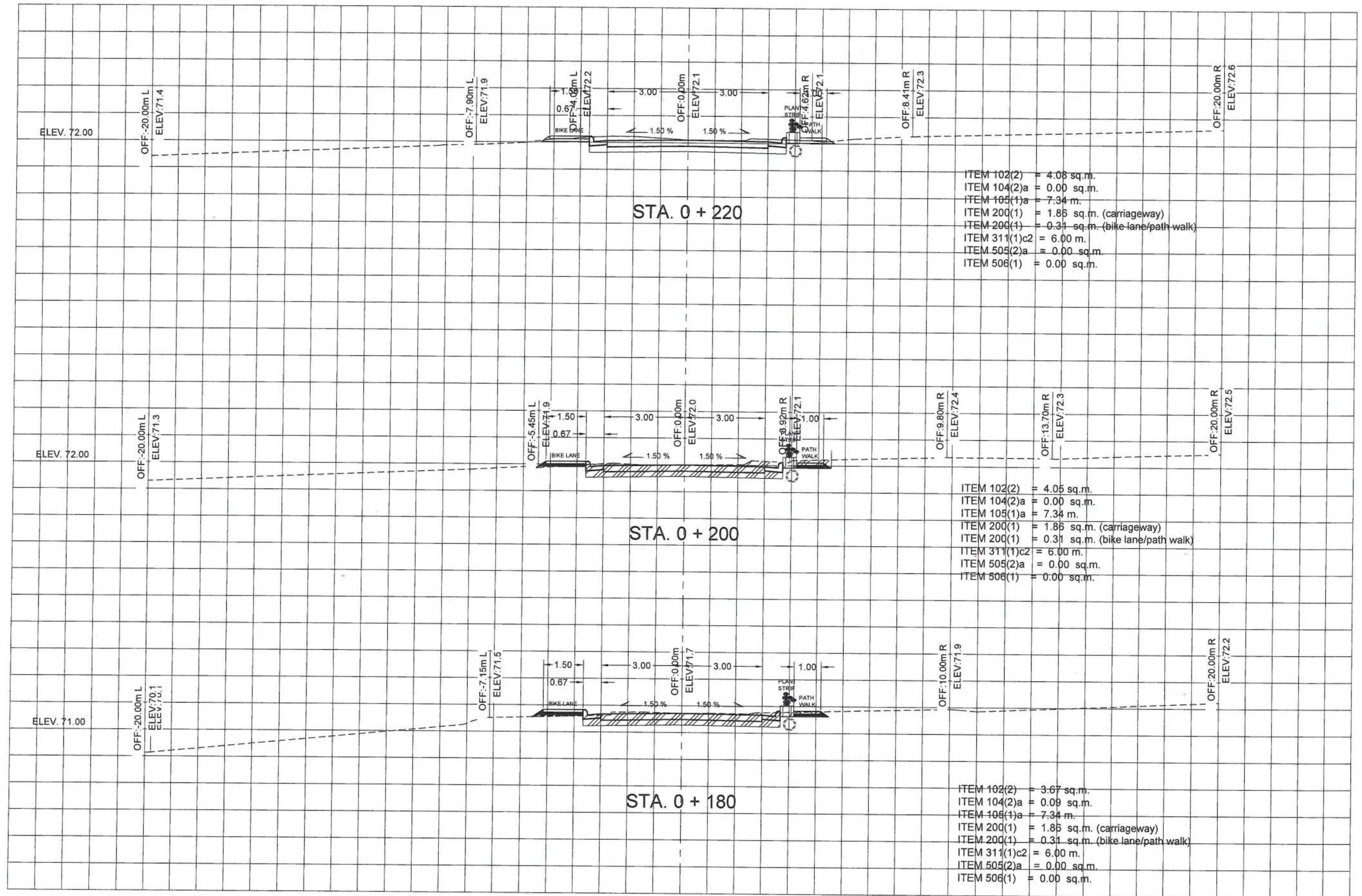
SILVERIO R. RAMOS, JR., DPM, DBA
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TARLAC AGRICULTURAL UNIVERSITY
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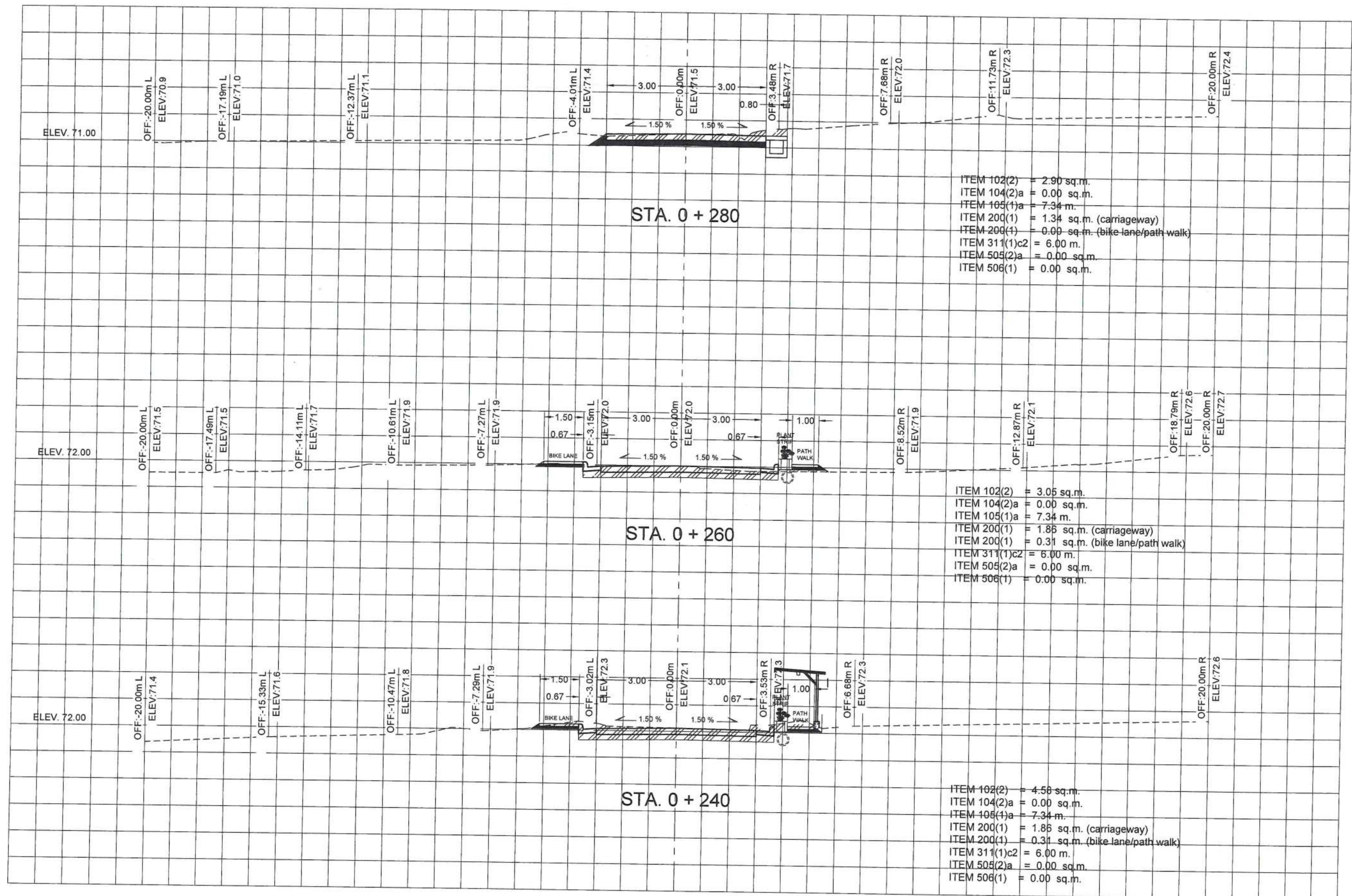
RECOMMENDED:
 MELQUIADES H. SITO DOMINGO
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 SILVERIO R. GONZALEZ, DBA
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SET NO.

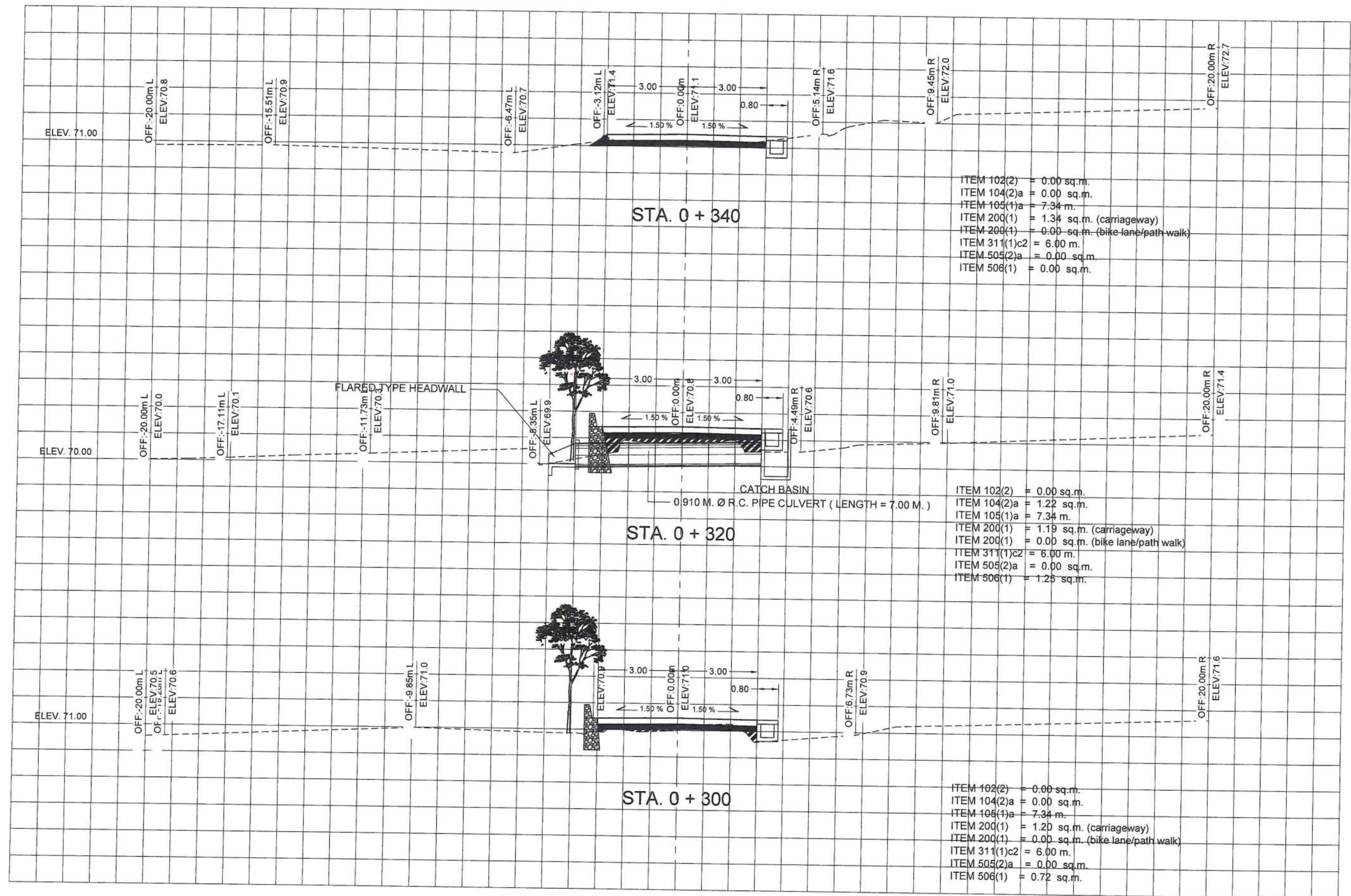
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CROSS SECTIONS

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REVIEWED

CARINA Q. SAZO
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MELQUIADES H. STO. DOMINGO
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APPROVED

ROSELLER A. TOLENTINO
 REGIONAL DIRECTOR
 DATE:

CONCURRED

SILVERIO TORILLO JR., DBA
 UNIVERSITY PRESIDENT
 TARLAC AGRICULTURAL UNIVERSITY
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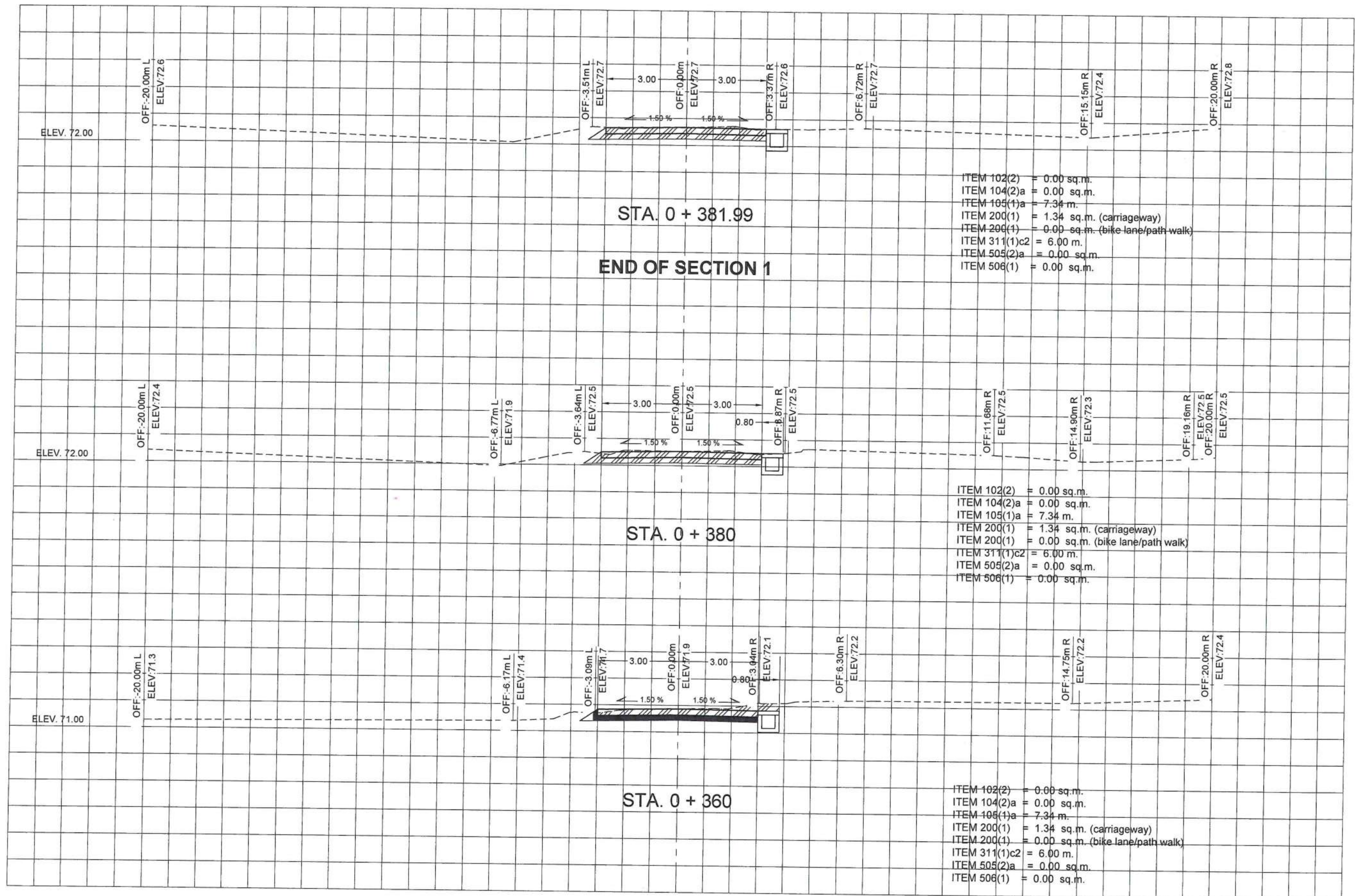
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CROSS SECTIONS

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ENGINEER II

REVIEWED:

CARINA C. GAZO
CHIEF, BRIDGE & OTHER PUBLIC WORKS
DESIGN SECTION
DATE:

SUBMITTED:

ARTHUR Q. SANTOS
CHIEF, PLANNING AND DESIGN DIVISION
DATE:

RECOMMENDED:

MELQUIADES H. SITO DOMINGO
ASSISTANT REGIONAL DIRECTOR
DATE:

APPROVED:

ROSELLER A. TOLENTINO
REGIONAL DIRECTOR
DATE:

CONCURRED:

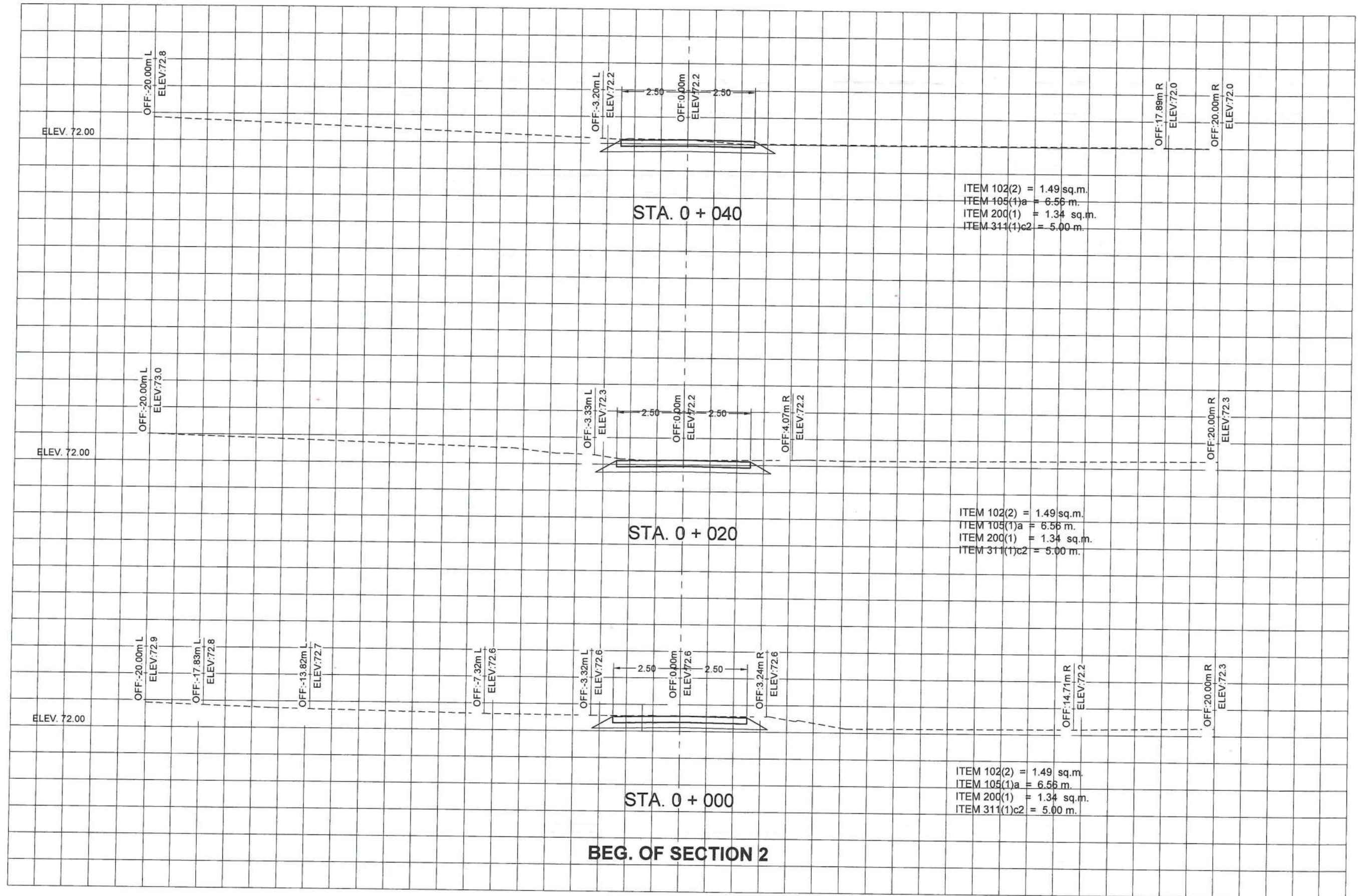
SILVERIO R. RAMOS, DBA
UNIVERSITY PRESIDENT
TARLAC AGRICULTURAL UNIVERSITY
DATE:

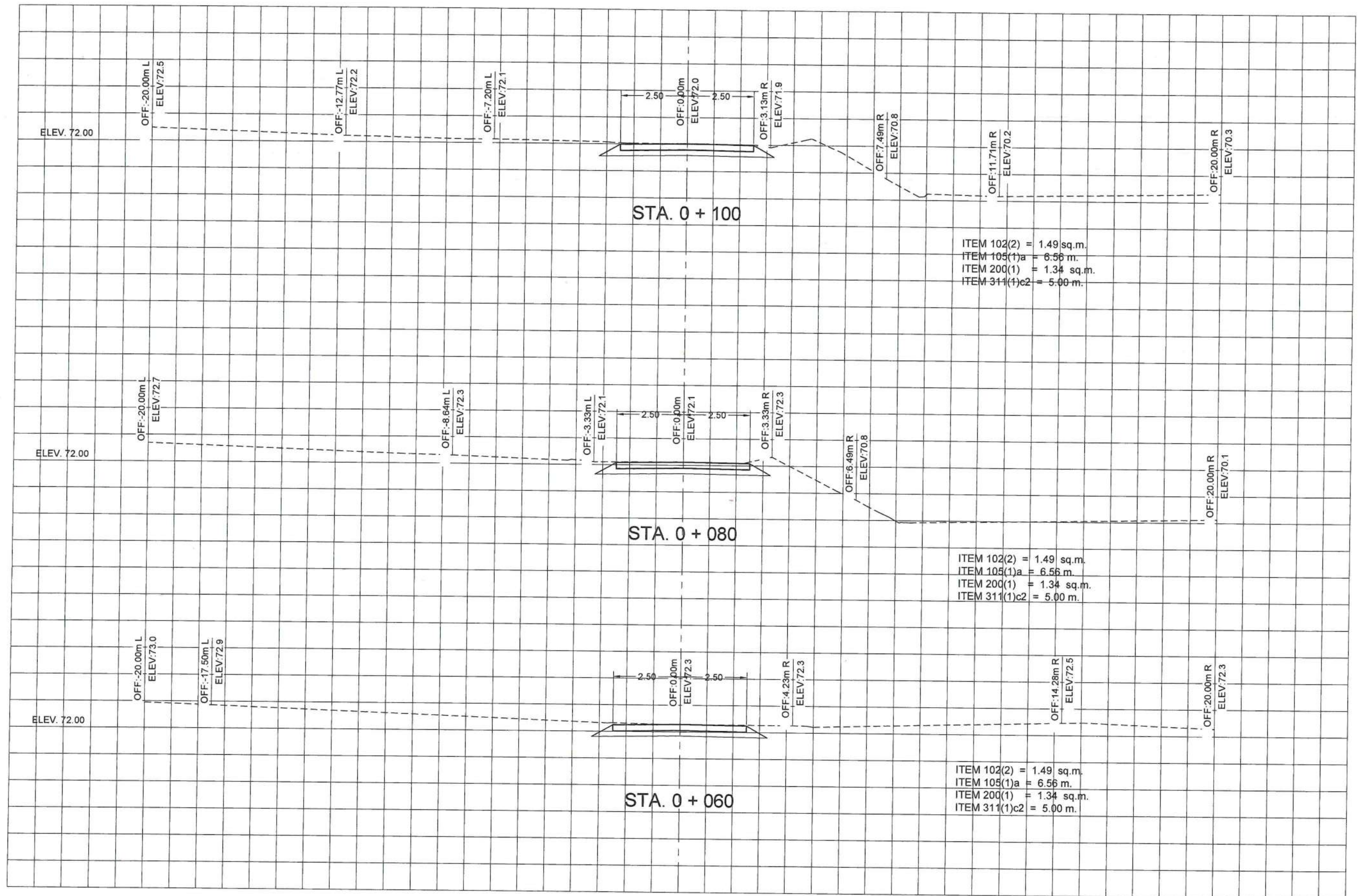
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C.Y. 2024 PROJECT
 DETAIL ENGINEERING DESIGN PLAN FOR
 STATE UNIVERSITIES AND COLLEGES (SUCs)
 REPAIR AND REHABILITATION OF ROAD NETWORKS WITH
 PROVISION OF WALKABLE PEDESTRIAN PATHWAYS FOR
 EMPLOYEES AND STUDENTS AND THOSE WITH SPECIAL
 NEEDS (PHASE 1)
 TARLAC AGRICULTURAL UNIVERSITY
 PROVINCE OF TARLAC

CROSS SECTIONS

PREPARED & ENCODED:
 JULIE ANN S. DAVID
 ENGINEER II

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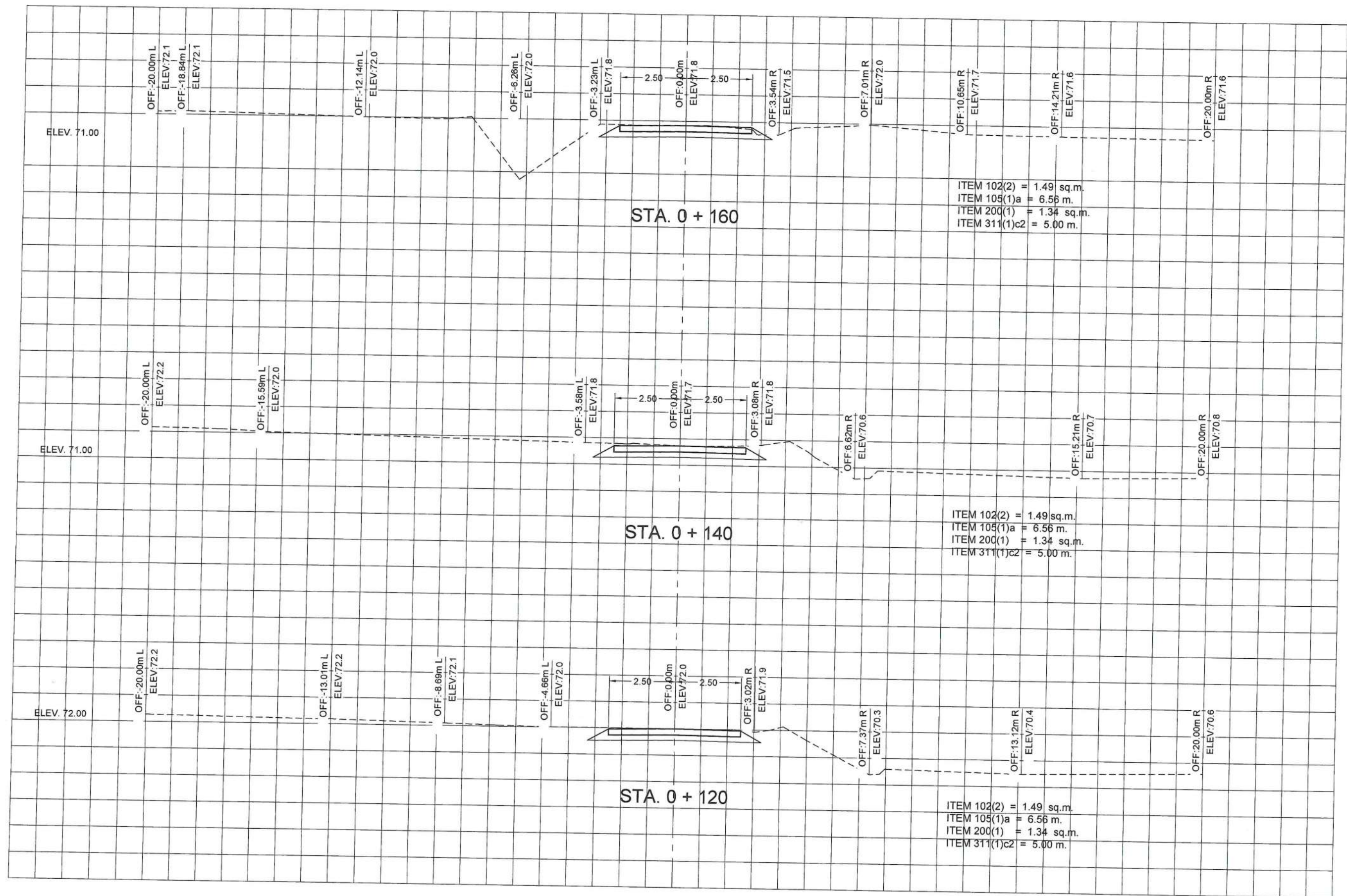
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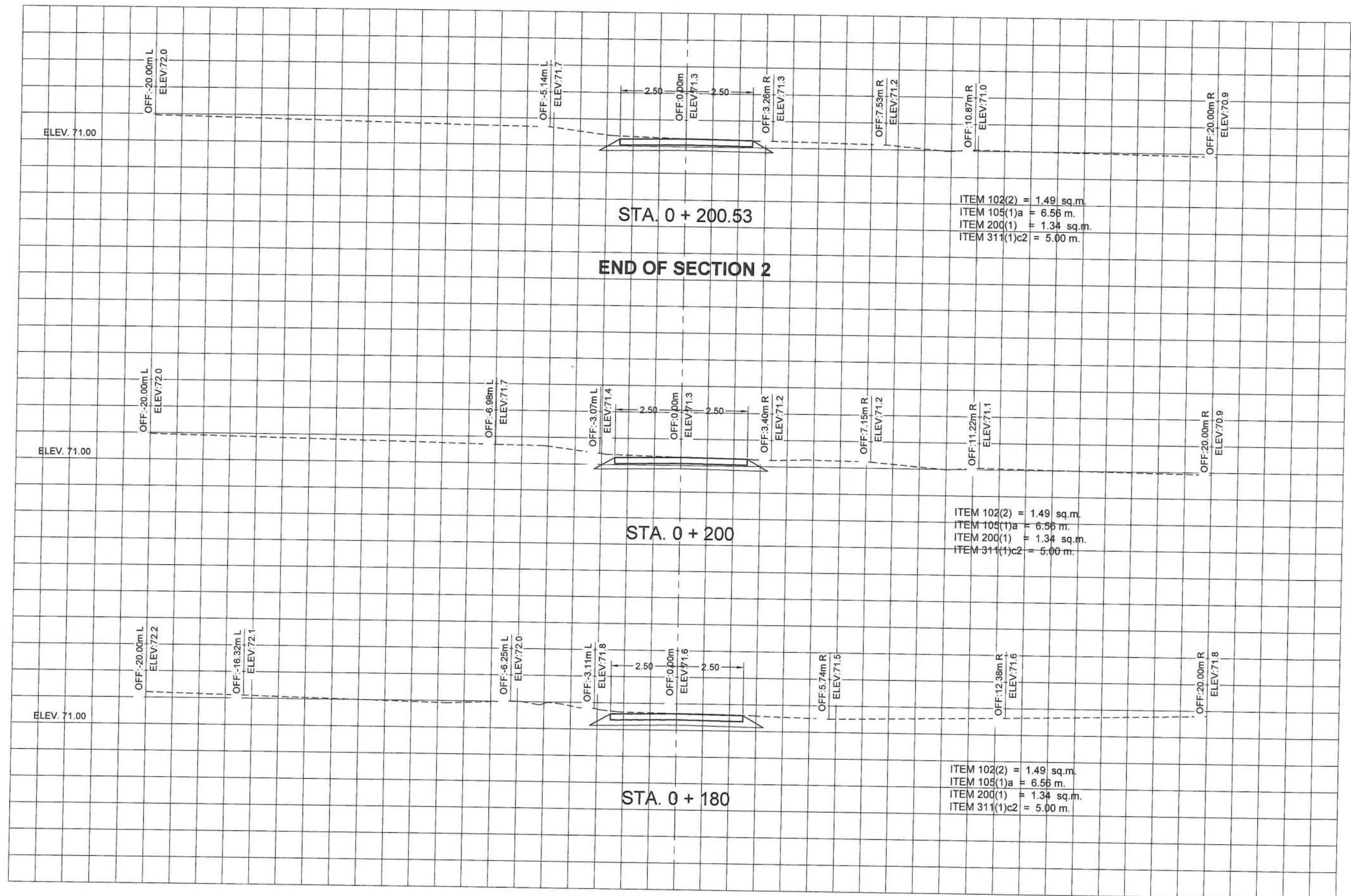
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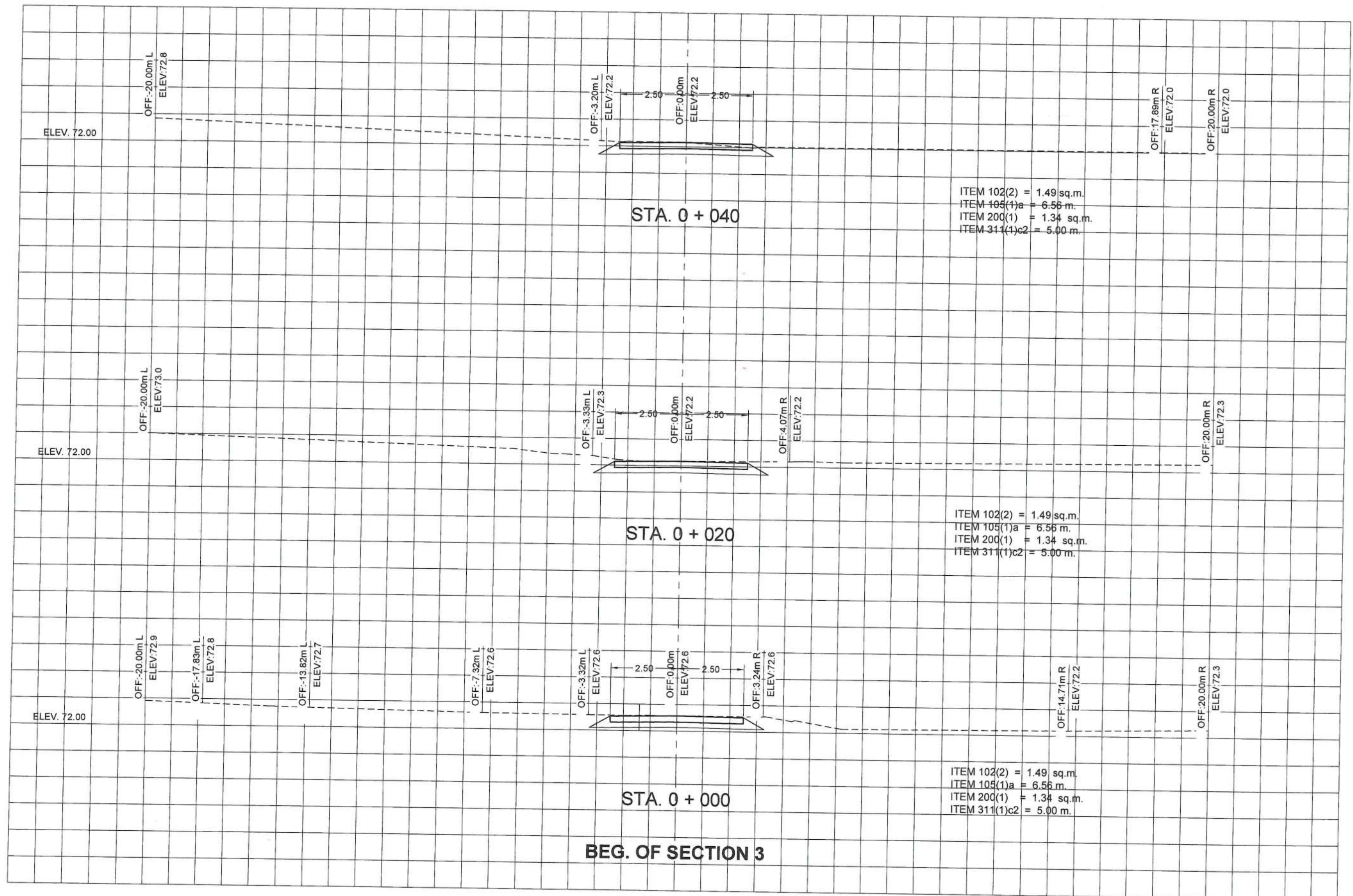
SILVERIO R. RIVERA, DBA
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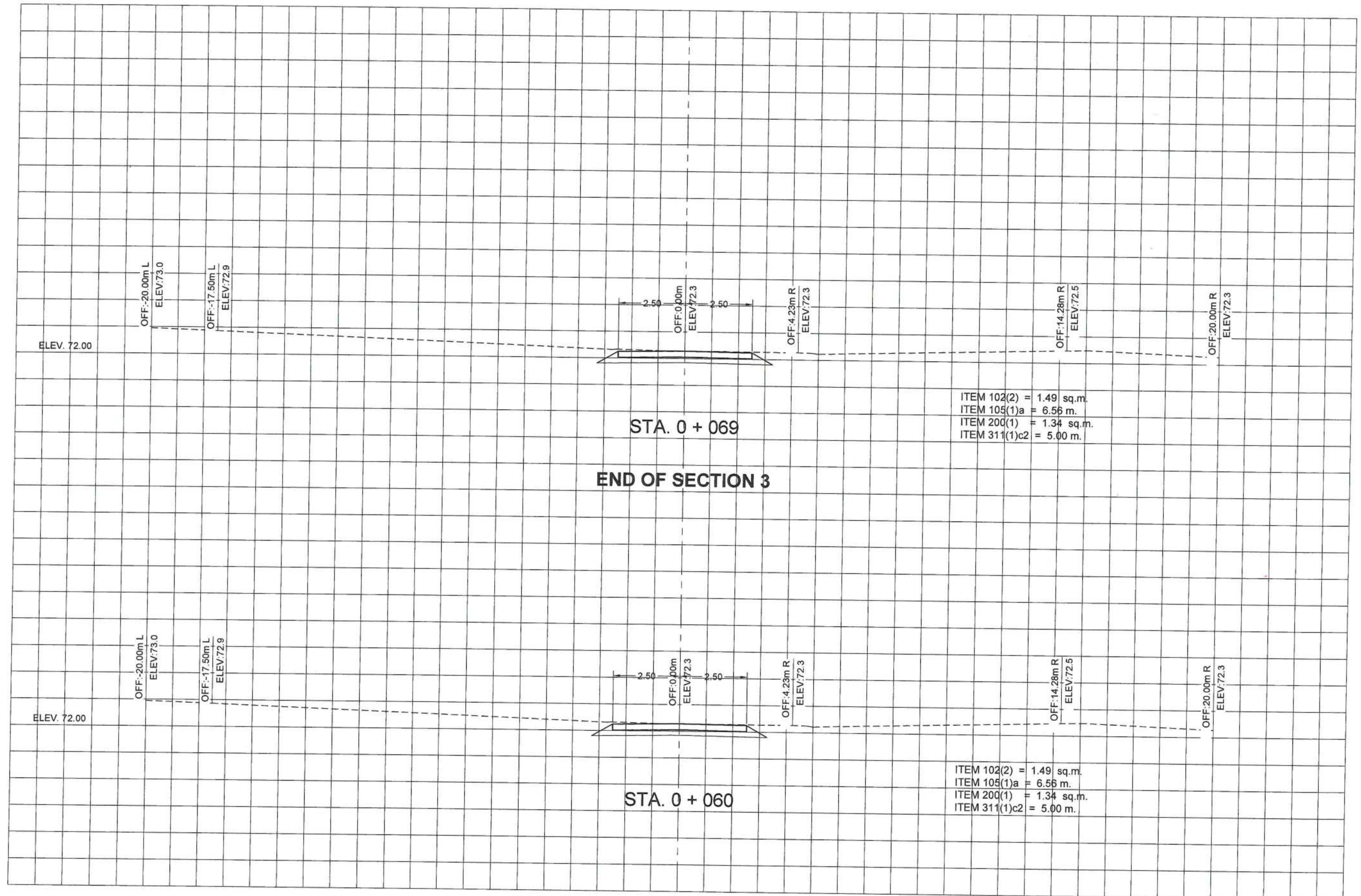
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CROSS SECTIONS

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Julie Ann S. David
JULIE ANN S. DAVID
ENGINEER II

REVIEWED

Carina G. Gazo
CARINA G. GAZO
CHIEF, BRIDGE & OTHER PUBLIC WORKS
DESIGN SECTION
DATE:

SUBMITTED

Arthur Q. Santos
ARTHUR Q. SANTOS
CHIEF, PLANNING AND DESIGN DIVISION
DATE:

RECOMMENDED

Mel Quiades H. Sto. Domingo
MEL QUIADES H. STO. DOMINGO
ASSISTANT REGIONAL DIRECTOR
DATE:

APPROVED

Roseller A. Tolentino
ROSELLER A. TOLENTINO
REGIONAL DIRECTOR
DATE:

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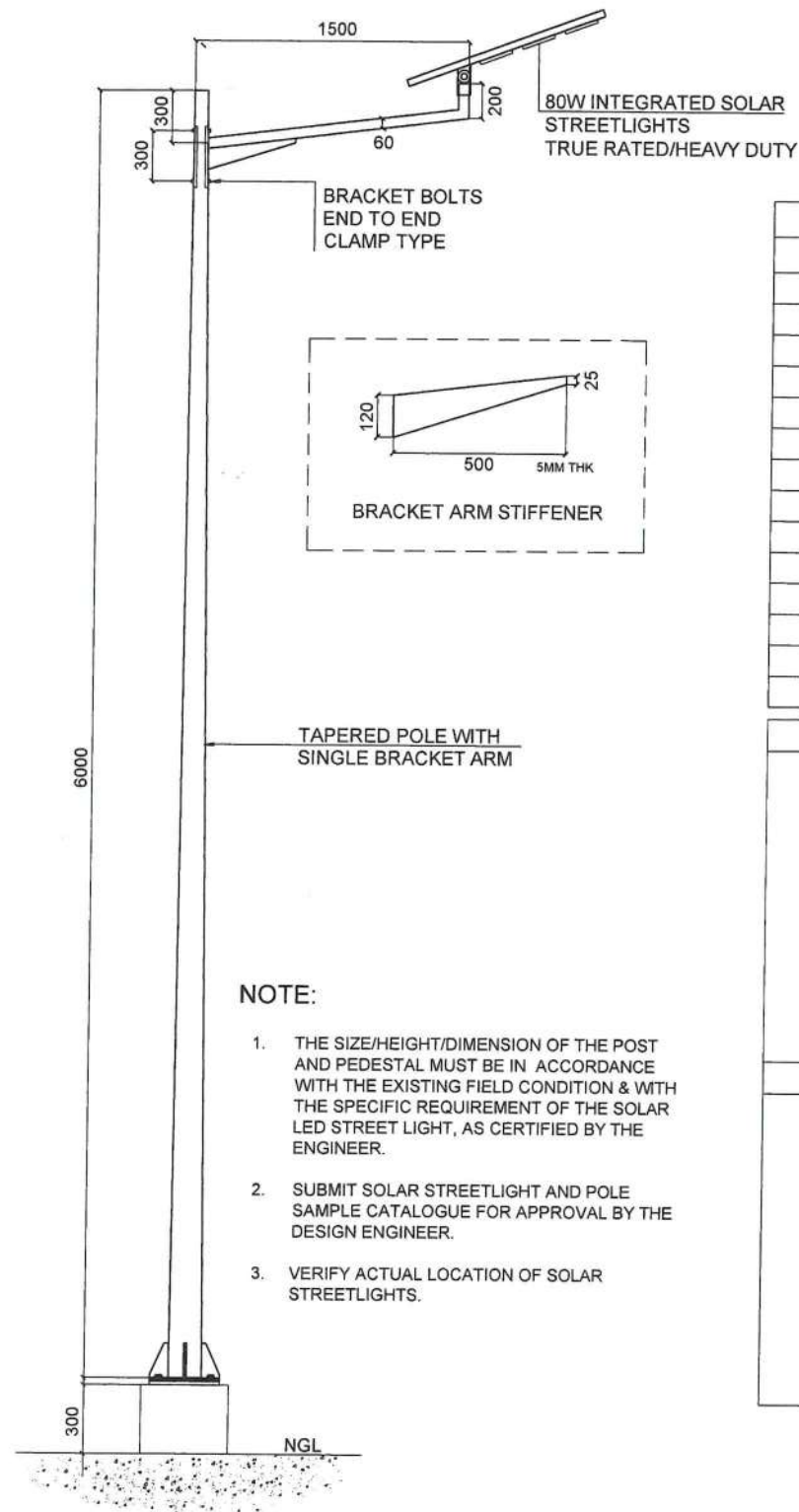
Silverio N. Narayan, Sr.
SILVERIO N. NARAYAN, SR.
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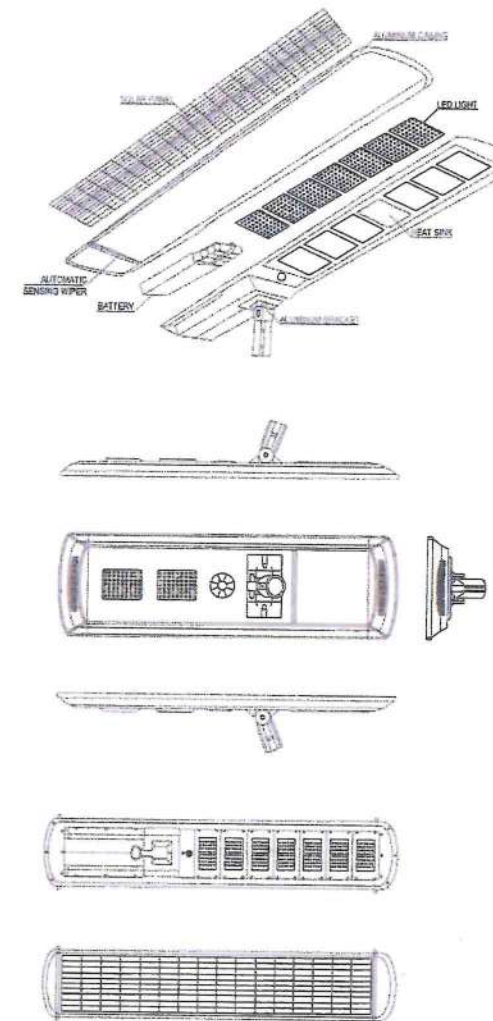
NOTE:

1. THE SIZE/HEIGHT/DIMENSION OF THE POST AND PEDESTAL MUST BE IN ACCORDANCE WITH THE EXISTING FIELD CONDITION & WITH THE SPECIFIC REQUIREMENT OF THE SOLAR LED STREET LIGHT, AS CERTIFIED BY THE ENGINEER.
2. SUBMIT SOLAR STREETLIGHT AND POLE SAMPLE CATALOGUE FOR APPROVAL BY THE DESIGN ENGINEER.
3. VERIFY ACTUAL LOCATION OF SOLAR STREETLIGHTS.

LAMP POST DETAILS / SPECIFICATIONS	
DESCRIPTION	MEASUREMENTS
POLE HEIGHT	6 METERS
BOTTOM DIAMETER	200mm
TOP DIAMETER	75mm
POLE THICKNESS	3.5mm
BASEPLATE	400 x 400 x 20mm
CENTER TO CENTER	200mm
ANCHOR BOLTS	1" x 20" x 3"
COATED	HOT DIPPED GALVANIZED
STIFFENER SIZE	H200 x L100 x W20mm
STIFFENER THICKNESS	16mm
ARM SIZE	L1500 x Ø60mm
ARM THICKNESS	3.5mm
ARM STIFFENER SIZE	L500 x H120 x W25mm
ARM STIFFENER THK	5mm

BASE PLATE DETAILS	ANCHOR BOLTS
400 100 20MM THK Ø25 200 400 NOTE: ADD 5MM ON ACTUAL POLE	20" 1" 3"
STIFFENER	BRACKET BOLTS
100 16MM THK 400 200 20	SIZE: 3/4" x 5" HALF THREAD SINGLE NUT DOUBLE WASHER

LUMINAIRE DETAIL / SPECIFICATIONS



INTEGRATED SOLAR STREETLIGHT TECHNICAL PARAMETERS		
SOLAR PHOTOVOLTAIC PANEL	OPERATING VOLTAGE AND POWER	12V - 36V 60 - 310 W (SHOULD BE GREATER THAN 90% AFTER 10 YEARS AND LESS THAN 90% AFTER 25 YEARS)
	LIFETIME	>25 YEARS
	MATERIAL	MONOCRYSTALLINE POLYCRYSTALLINE SILICON
	WEIGHT	<25 KG
BATTERY	ALLOWABLE AMBIENT TEMPERATURE RANGE	-40°C TO +60°C
	INPUT VOLTAGE	12.0V
	TYPE	LITHIUM-ION OR LEAD-ACID TYPE ELECTROLYTE PLATE LEAD-ACID WITH LOW ANTIMONY LEAD ALLOY PLATES AND CERAMIC VENT PLUGS
	LIFETIME	8 - 10 YEARS
CHARGE CONTROLLER	CHARGING AND DISCHARGING CYCLES	2000
	CHARGING TIME	7 HOURS
	WORKING TIME UNDER RAINY DAYS	10 DAYS
	INTELLIGENT CONTROL FOR CIRCUIT PROTECTION	FEATURE: TIMING, DIMMING, AND SENSOR
LIGHT-EMITTING DIODE (LED) LAMP	LIGHT OUTPUT	50W TO 300 W
	SYSTEM FLUX	5000 - 30,000 LM
	COLOR TEMPERATURE	2,000K - 3,500K (WARM WHITE) 3,000K - 4,500K (COOL WHITE) 5,500K - 6,500K (DAYLIGHT)
	OPTICAL COVER / LENS TYPE	POLYCARBONATE COVER DIMMABLE AND DESIGNED TO OPERATE MAINTENANCE FREE FOR 50,000 HOURS WITH A COMPATIBILITY TO WIRELESS LIGHTING CONTROL PROTOCOLS
	DRIVER	LIFETIME: >50,000 HOURS
	PHOTO CONTROLLER	INDIVIDUAL OR GROUP
	HOUSING	HIGH PRESSURE DIE-CAST ALUMINUM WITH HEAT MANAGEMENT SYSTEM AND RUST RESISTANT
	RANGE	-40°C TO +60°C
	RANGE FOR CHARGING	0°C TO +45°C
	RANGE FOR DISCHARGING	-20°C TO +35°C
ALLOWABLE AMBIENT TEMPERATURE	CHARGE TIME	7 HOURS UNDER DIRECT AND STRONG SUNLIGHT
IP RATING	WARRANTY PERIOD	IP 65 8 YEARS MINIMUM

1 SOLAR STREETLIGHT DETAIL

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SCALE

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SOLAR STREETLIGHT DETAIL

PREPARED & ENCODED

ROWEL G. DAVID
ENGINEER II

REVIEWED

CARINA C. GAZO
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