

# ALLEGAN COUNTY ROAD COMMISSION

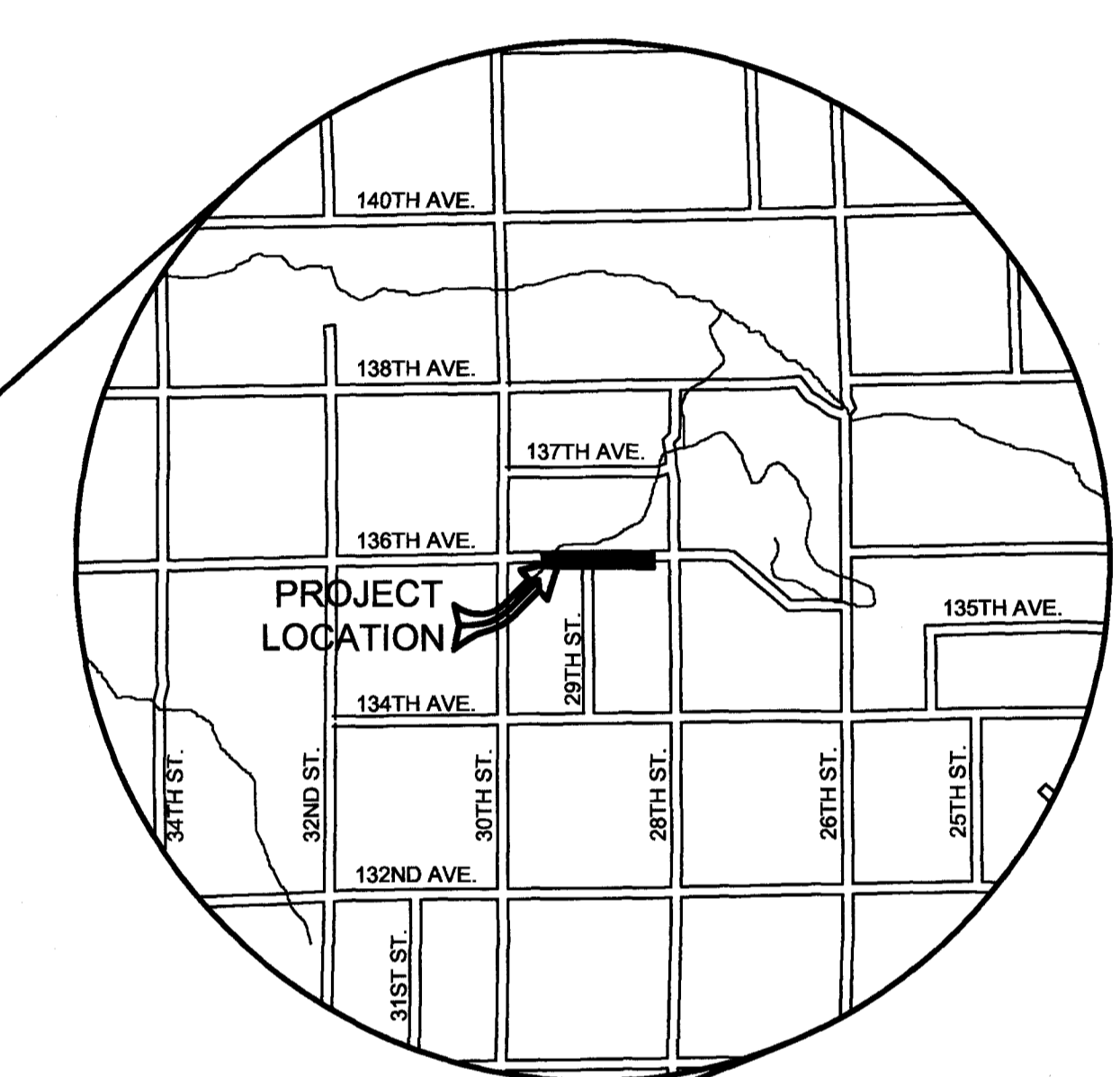
## 136TH AVENUE CULVERT REPLACEMENTS 1,375, 2,955, & 4,365 FT EAST OF 30TH STREET MONTEREY & SALEM TOWNSHIPS

EXCEPT WHERE OTHERWISE INDICATED ON THESE PLANS OR IN THE PROPOSAL AND SUPPLEMENTAL SPECIFICATIONS CONTAINED THEREIN, ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2012 MICHIGAN DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION.

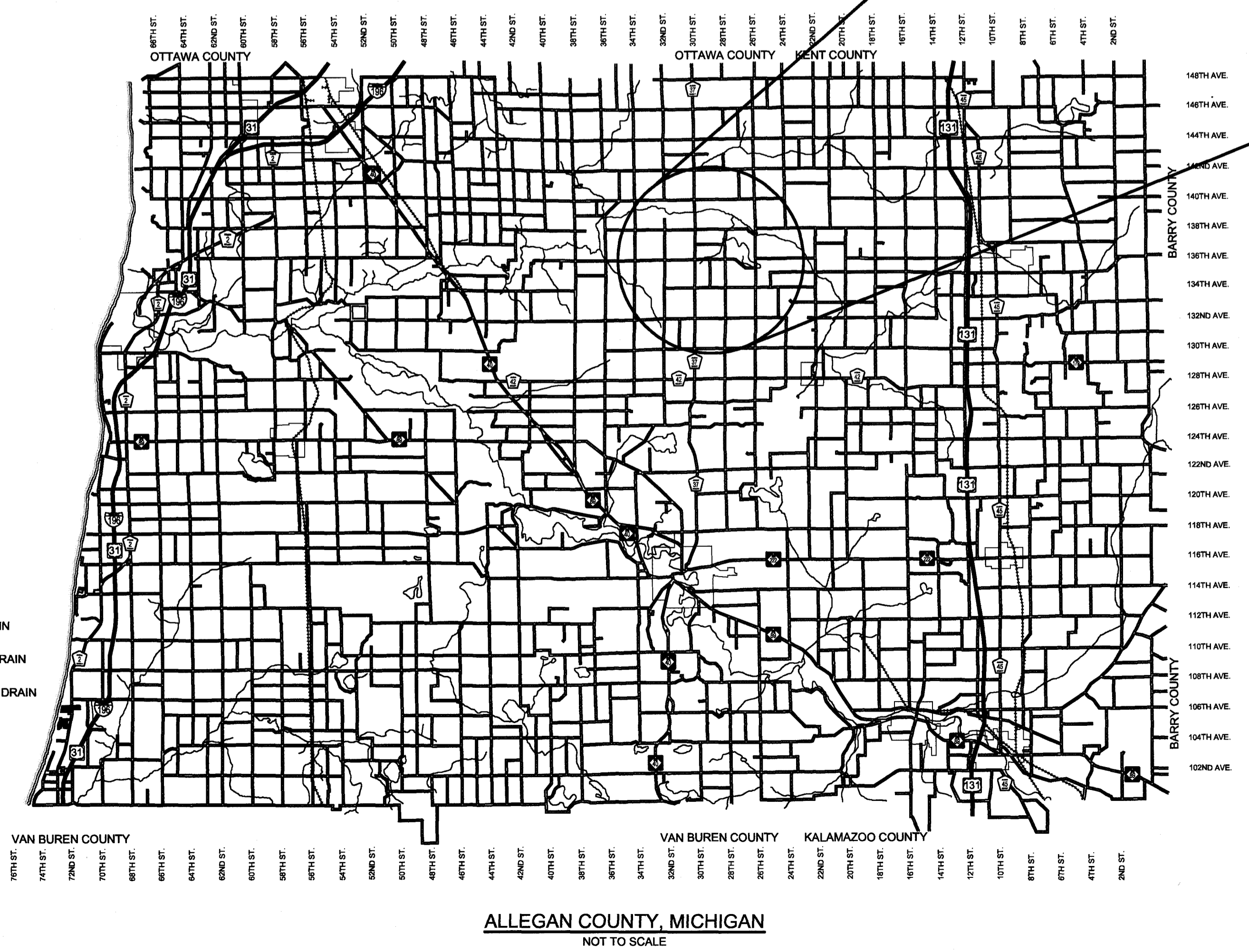
THE PLACING OF PAVEMENT MARKINGS AND TRAFFIC CONTROL SIGNS SHALL BE DONE IN ACCORDANCE WITH THE 2011 MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AS AMENDED.

THE IMPROVEMENTS COVERED BY THESE PLANS ARE IN ACCORDANCE WITH THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 2011 EDITION; A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS.

THE CONTRACTOR SHALL DIAL MISS DIG @ 811 FOR PROTECTION OF UNDER GROUND UTILITIES AND IN CONFORMANCE WITH PUBLIC ACT 174 OF 2013 A MINIMUM OF THREE FULL WORKING DAYS, EXCLUDING SATURDAYS, SUNDAYS AND HOLIDAYS PRIOR TO BEGINNING EACH EXCAVATION IN AREAS WHERE PUBLIC UTILITIES HAVE NOT BEEN PREVIOUSLY LOCATED. MEMBERS WILL THUS BE ROUTINELY NOTIFIED. THIS DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF NOTIFYING UTILITY OWNERS WHO MAY NOT BE A PART OF THE "MISS DIG" ALERT SYSTEM.



UTILITY CONTACTS	
<b>ELECTRIC</b> CONSUMERS ENERGY 4000 CLAY AVE, SW GRAND RAPIDS, MI 49548 616-530-4185 MS. KYLEE MAYCROFT grcivmp@cmsenergy.com	<b>GAS</b> CONSUMERS ENERGY 2500 E CORK ST KALAMAZOO, MI 49001 269-337-2366 MR. KYLE OAK kyle.oak@cmsenergy.com
<b>TELEPHONE</b> AT&T 2919 MILCORK STREET ROOM 101 KALAMAZOO, MI 49001 269-394-4472 MS. CARRIE DEMOTT cd3249@att.com	"MISS DIG" 811
<b>CABLE</b> CHARTER 4178 COMMERCIAL AVE PORTAGE, MI 49002 269-217-8152 MR. LEO SCOFIELD leo.scofield@charter.com	
<b>GAS</b> MICHIGAN GAS UTILITY MR. DAVID MAUER 742 E ALLEGAN STREET OTSEGO, MI 49078 269-692-3911 DAMaurer@michigan gasutilities.com	



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- 1 - COVER SHEET
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**CONTRACT FOR ROAD IMPROVEMENTS**  
THREE CULVERT REPLACEMENTS INCLUDING GRADE ESTABLISHMENT, SAND SUBBASE, AGGREGATE BASE, HMA PAVING, GRAVEL SHOULDERS, AND RESTORATION ON 136TH AVENUE APPROXIMATELY 1,375, 2,955, & 4,365 FEET EAST OF 30TH STREET IN MONTEREY & SALEM TOWNSHIPS, ALLEGAN COUNTY.

PREPARED UNDER THE SUPERVISION OF:

*Ryan P. Brown*

RYAN P. BROWN  
REGISTERED PROFESSIONAL ENGINEER No. 65933

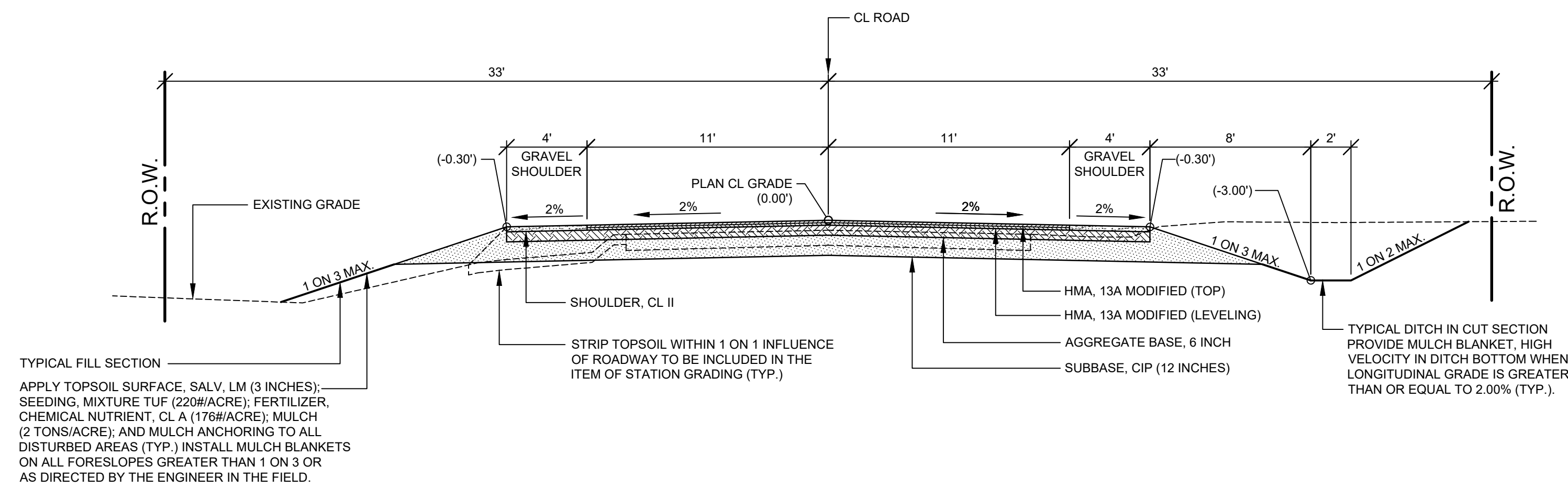
**Board of County Road Commissioners  
Of Allegan County**  
1308 LINCOLN ROAD  
ALLEGAN, MICHIGAN 49010-9762  
TELEPHONE (269) 673-2184 www.alleganroads.org FAX (269) 673-5922

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**136TH AVENUE CULVERT REPLACEMENTS**  
MONTEREY & SALEM TOWNSHIP - 1,375, 2,955, & 4,365 FT EAST OF 30TH STREET

COVER SHEET

<b>DRAWN BY:</b>	RPB
<b>REVIEWED BY:</b>	JSE
<b>DATE:</b>	MAY, 2019
<b>SCALE:</b>	NONE



**TYPICAL SECTION - 136TH AVENUE**

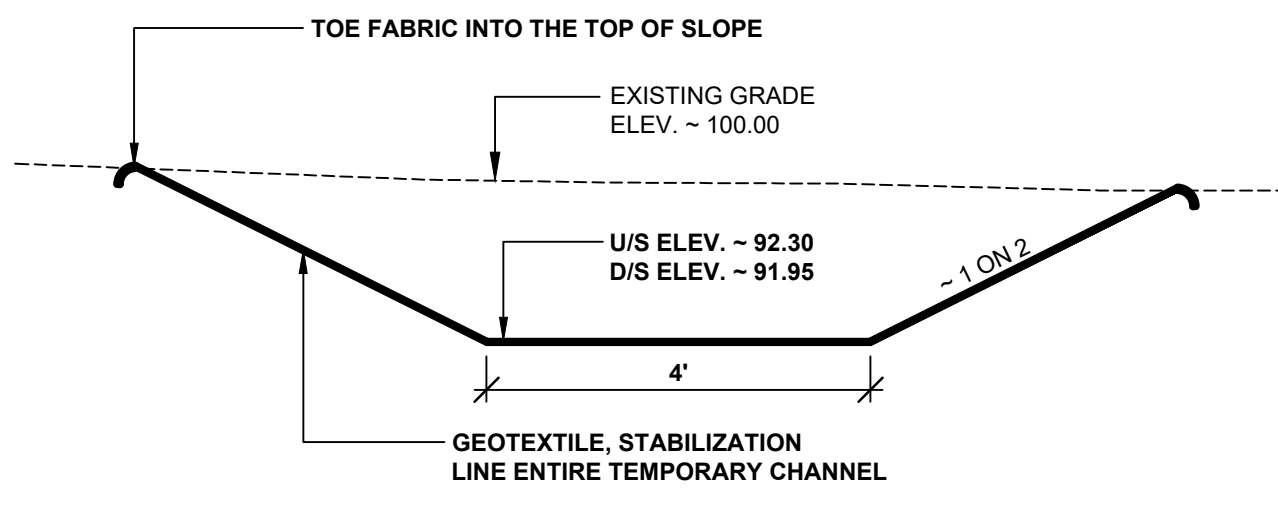
SCALE: 1" = 5'

TYPICAL FILL SECTION  
 APPLY TOPSOIL SURFACE, SALV. LM (3 INCHES); SEEDING, MIXTURE TUF (220#/ACRE); FERTILIZER, CHEMICAL NUTRIENT, CL A (176#/ACRE); MULCH (2 TONS/ACRE); AND MULCH ANCHORING TO ALL DISTURBED AREAS (TYP.) INSTALL MULCH BLANKETS ON ALL FORESLOPES GREATER THAN 1 ON 3 OR AS DIRECTED BY THE ENGINEER IN THE FIELD.

SHOULDER, CL II  
 STRIP TOPSOIL WITHIN 1 ON 1 INFLUENCE OF ROADWAY TO BE INCLUDED IN THE ITEM OF STATION GRADING (TYP.)

HMA, 13A MODIFIED (TOP)  
 HMA, 13A MODIFIED (LEVELING)  
 AGGREGATE BASE, 6 INCH  
 SUBBASE, CIP (12 INCHES)

TYPICAL DITCH IN CUT SECTION PROVIDE MULCH BLANKET, HIGH VELOCITY IN DITCH BOTTOM WHEN LONGITUDINAL GRADE IS GREATER THAN OR EQUAL TO 2.00% (TYP.).



**TEMPORARY CHANNEL CROSS SECTION**

SCALE 1" = 2'

ITEM	AWI	YIELD	PERFORMANCE GRADE
HMA, 13A MODIFIED (TOP)	260	220 #/SYD	P.G. 64 - 28
HMA, 13A MODIFIED (LEVELING)		220 #/SYD	P.G. 64 - 28
HMA BOND COAT (NOT A PAY ITEM)		0.05 TO 0.15 GAL/SYD	SS - 1h

**HMA APPLICATION TABLE**

**PROJECT NOTES**

THE "2012 STANDARD SPECIFICATIONS FOR CONSTRUCTION" AND "STANDARD PLANS" BY THE MICHIGAN DEPARTMENT OF TRANSPORTATION (MDOT) ARE HEREBY INCORPORATED INTO THESE CONTRACT DOCUMENTS. COPIES OF THESE STANDARDS ARE AVAILABLE FOR INSPECTION AT THE OFFICE OF THE ENGINEER.

THE CONTRACTOR WILL BE RESPONSIBLE FOR CONTACTING THE ALLEGAN COUNTY ROAD COMMISSION TO NOTIFY THEM THAT WORK IS COMMENCING AT LEAST ONE WEEK PRIOR TO CONSTRUCTION. THE CONTRACTOR WILL SET UP THE NECESSARY DETOUR ROUTE AND WILL BE RESPONSIBLE FOR PROVIDING THE BARRICADES.

THE CONTRACTOR SHOULD NOTE THAT STATION GRADING WILL INCLUDE THE REMOVAL OF FENCES, CULVERTS, BRUSH, TREES SMALLER THAN 6" CONCRETE FOUNDATIONS, GUARDRAIL, AND MISCELLANEOUS ITEMS AS REQUIRED AND WILL ALSO INCLUDE ALL EARTH EXCAVATION, EMBANKMENT, AND ALL OTHER OPERATIONS NECESSARY TO DEVELOP THE DESIRED CROSS SECTION. ALL TOPSOIL AND OTHER UNSUITABLE MATERIAL LOCATED BENEATH THE PROPOSED PAVEMENT SECTION WILL BE REMOVED TO THE SUBGRADE ELEVATION AS PART OF STATION GRADING. ALL TOPSOIL REMOVED MAY BE STOCKPILED AND REUSED AS TOPSOIL SURFACE, SALV. LM.

ALL FILL FOR THIS PROJECT MUST BE OBTAINED AND FURNISHED BY THE CONTRACTOR. ALL REQUIRED FILL SHALL BE SELECTED EXCAVATED MATERIAL FROM THE SITE APPROVED BY THE ENGINEER OR MDOT CLASS II GRANULAR MATERIAL FROM BORROW. EXCESS FILL WILL BE REMOVED FROM SITE BY THE CONTRACTOR. NO BORROW OR SOIL REMOVAL ARRANGEMENTS HAVE BEEN PREARRANGED FOR THIS PROJECT AND WILL BE THE TOTAL RESPONSIBILITY OF THE CONTRACTOR.

THE ITEM OF SUBBASE, CIP WILL BE PAID FOR AT PLAN QUANTITY EXCEPT IN THE CASE OF A DESIGN CHANGE OR DEMONSTRATED ERROR.

ALL DISTURBED AREAS NOT TO BE PAVED WILL BE RESTORED WITH TOPSOIL SURFACE, SALV. LM (3 INCHES), MDOT SEED MIXTURE TUF (220#/ACRE); FERTILIZER, CHEMICAL NUTRIENT, CL A (176#/ACRE); AND MULCH AND MULCH ANCHORING (2 TON/ACRE) TO BE PAID AS RESTORATION (LUMP SUM).

ADEQUATE DUST CONTROL MEASURES WILL BE MAINTAINED BY THE CONTRACTOR AS DIRECTED BY THE ENGINEER IN THE FIELD, TO BE INCLUDED IN THE VARIOUS ITEMS OF WORK.

THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING EXISTING DRAINAGE PATTERNS, AND WILL RESOLVE ANY DRAINAGE PROBLEMS ON ADJACENT PROPERTIES WHICH MAY RESULT FROM THE CONTRACTOR'S ACTIVITIES.

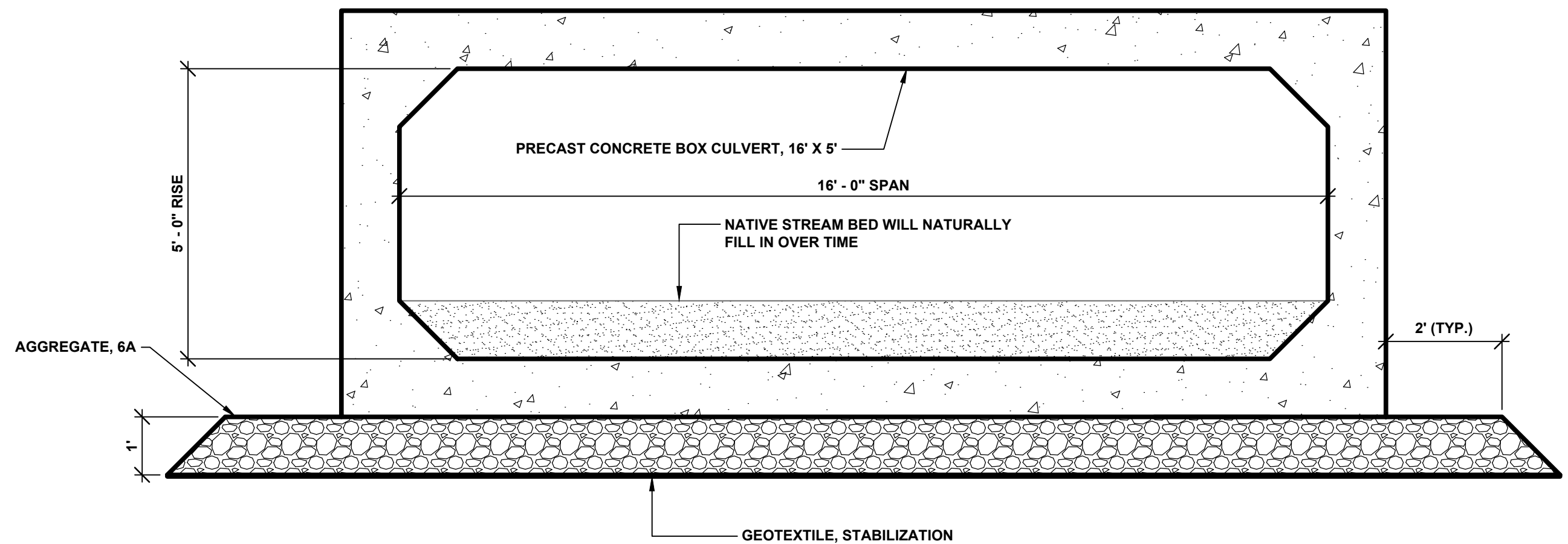
DATUM REFERS TO NAVD88 DATUM.

DIMENSIONS TAKE PRECEDENCE OVER SCALE. CONTRACTOR TO VERIFY ALL DIMENSIONS IN FIELD.

**UTILITY NOTES**

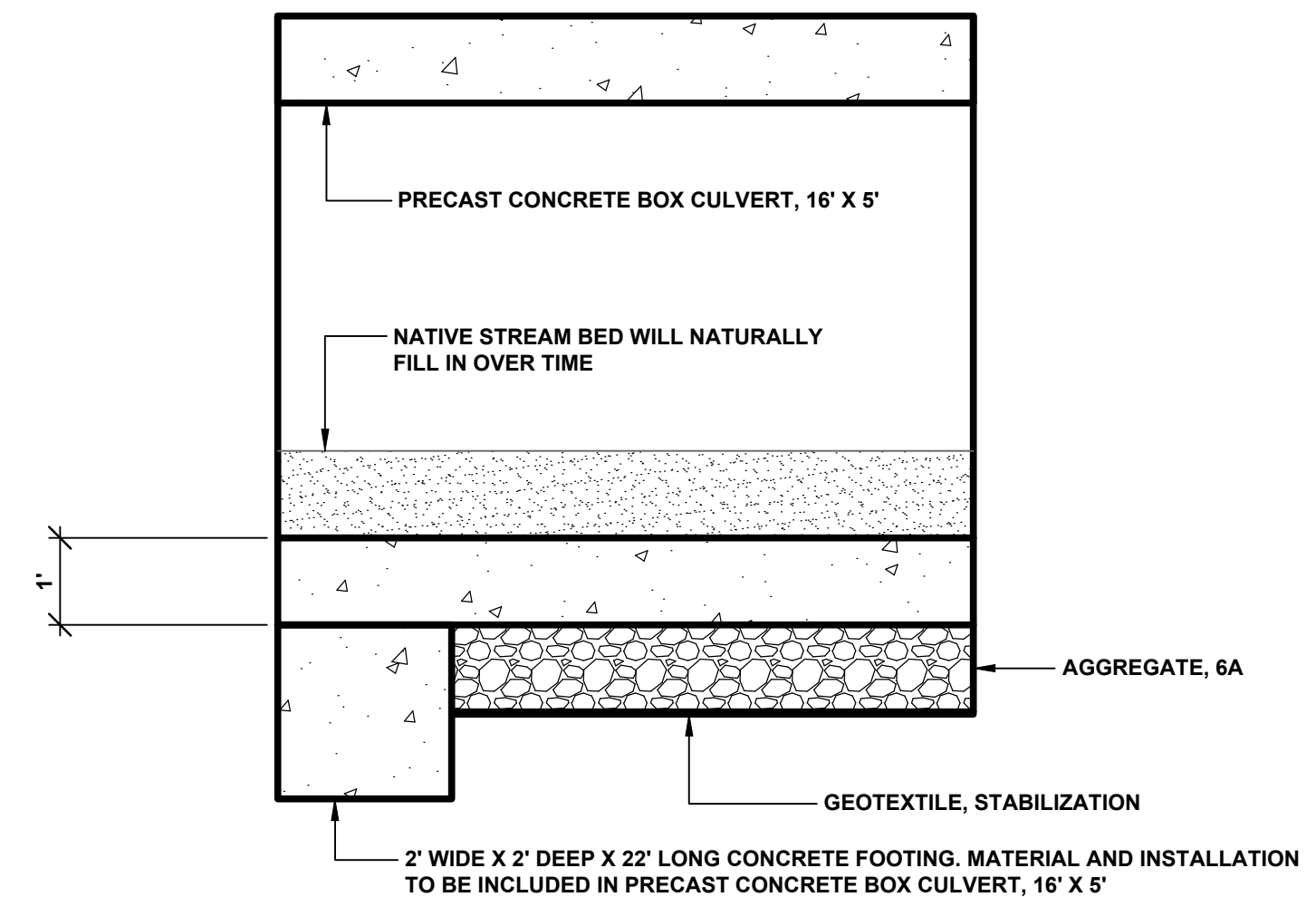
FOR PROTECTION OF UNDERGROUND UTILITIES AND IN CONFORMANCE WITH PUBLIC ACT 174 OF 2013, THE CONTRACTOR WILL CONTACT "MISS DIG" AT 811, A MINIMUM OF 72 HOURS, EXCLUDING SATURDAYS, SUNDAYS, AND HOLIDAYS, PRIOR TO BEGINNING EACH EXCAVATION IN AREAS WHERE PUBLIC UTILITIES HAVE NOT BEEN PREVIOUSLY LOCATED. MEMBERS WILL BE ROUTINELY NOTIFIED. THIS DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF NOTIFYING UTILITY OWNERS WHO MAY NOT BE A PART OF THE "MISS DIG" ALERT SYSTEM.

THE CONTRACTOR WILL LOCATE ALL ACTIVE UNDERGROUND UTILITIES PRIOR TO STARTING WORK AND WILL CONDUCT HIS OPERATIONS IN A MANNER AS TO ENSURE THAT THOSE UTILITIES NOT REQUIRING RELOCATION WILL NOT BE DISTURBED.



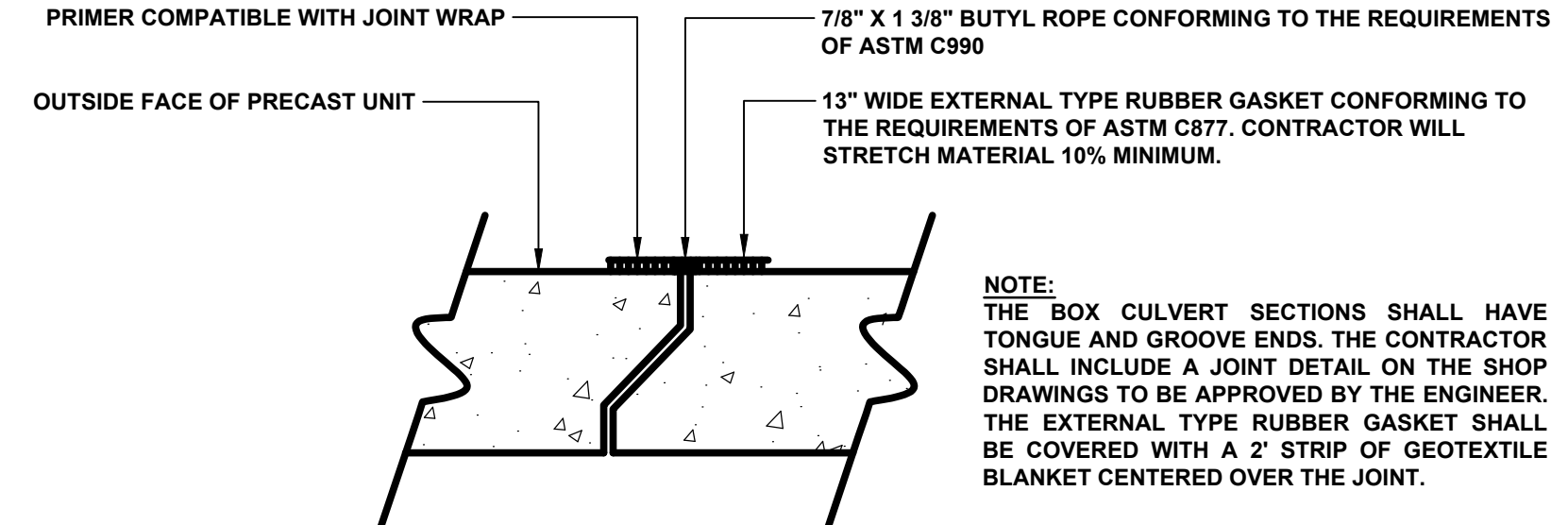
**SECTION A - A**

SCALE 1" = 2'



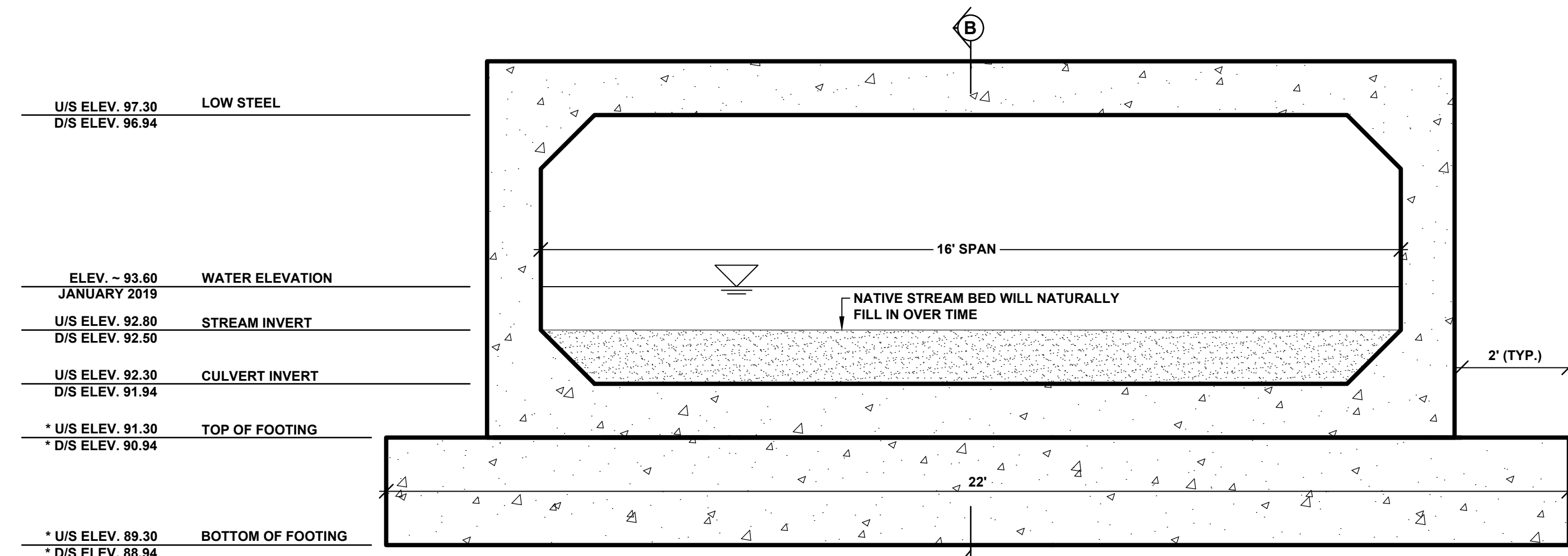
**SECTION B - B**

SCALE 1" = 2'



**TYPICAL JOINT SEAL DETAIL**

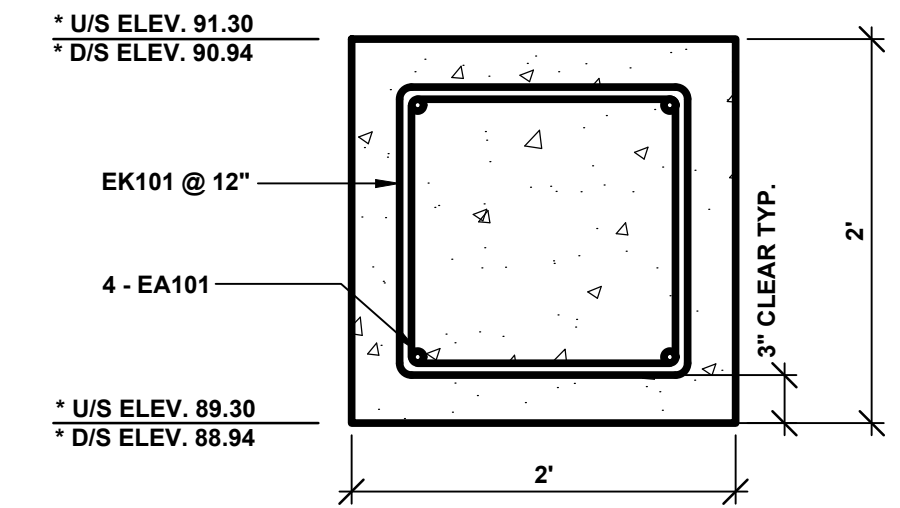
NOTE: THE BOX CULVERT SECTIONS SHALL HAVE TONGUE AND GROOVE ENDS. THE CONTRACTOR SHALL INCLUDE A JOINT DETAIL ON THE SHOP DRAWINGS TO BE APPROVED BY THE ENGINEER. THE EXTERNAL TYPE RUBBER GASKET SHALL BE COVERED WITH A 2" STRIP OF GEOTEXTILE BLANKET CENTERED OVER THE JOINT.



**TYPICAL INLET AND OUTLET SECTION FEIT DRAIN**

SCALE 1" = 2'

\* NOTE: INVERT ELEVATION OF BOX CULVERT GOVERNS. TOP OF FOOTING & BOTTOM OF FOOTING ELEVATIONS MAY VARY BASED UPON THE MANUFACTURER'S CULVERT DESIGN. CONTRACTOR IS RESPONSIBLE FOR ADJUSTING THE FOOTING ACCORDINGLY.



**FOOTING DETAIL**

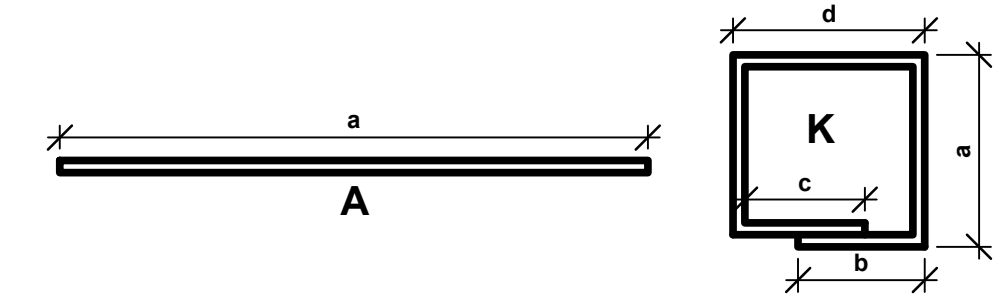
SCALE 1" = 1'

STEEL REINFORCEMENT SCHEDULE								
BAR	a	b	c	d	SIZE	LENGTH	NO. REQUIRED	TOTAL WEIGHT
EA101	21' - 6"				#6	21' - 6"	8	258
EK101	1' - 6"	1' - 0"	1' - 0"	1' - 6"	#6	6' - 6"	46	449

NOTES:  
 ALL RIGHT ANGLE BENDS IN REINFORCING STEEL TO BE MADE ABOUT A PIN OF THE MINIMAL DIAMETER ALLOWED BY THE STANDARD SPECIFICATIONS.

THE CONTRACTOR IS RESPONSIBLE FOR CHECKING THE ABOVE REINFORCING STEEL QUANTITIES AND LENGTHS PRIOR TO ORDERING DELIVERY OF STEEL.

STEEL REINFORCEMENT WITH BAR DESIGNATIONS BEGINNING WITH THE LETTER "E" WILL BE EPOXY COATED.



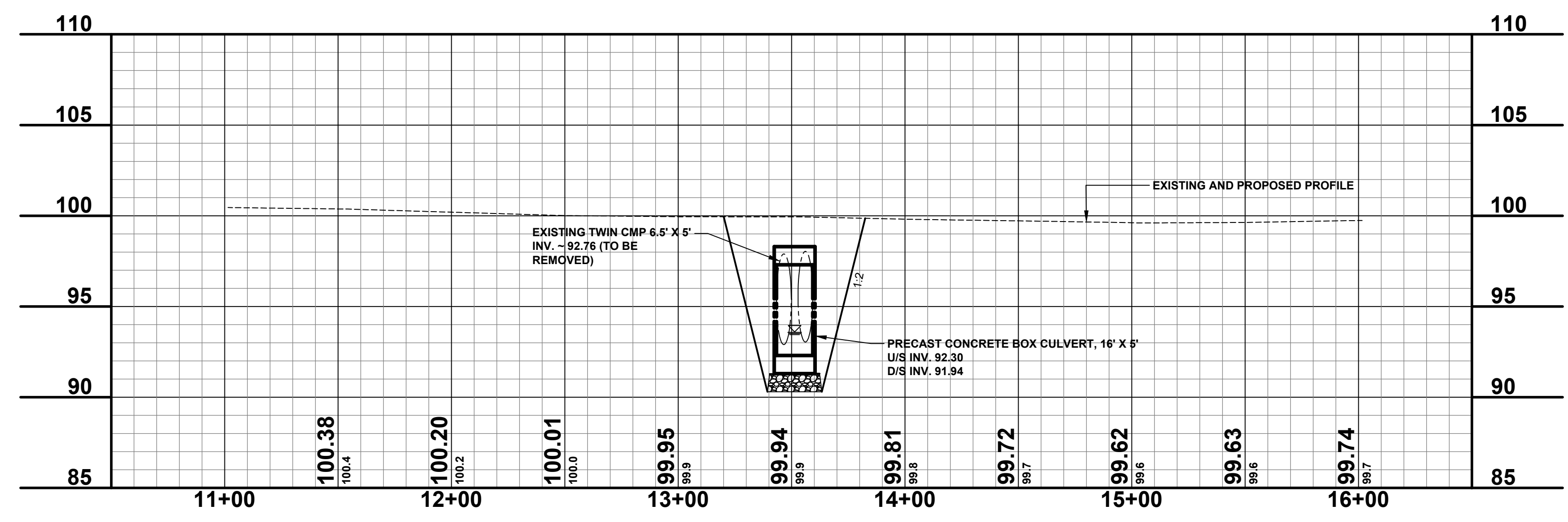
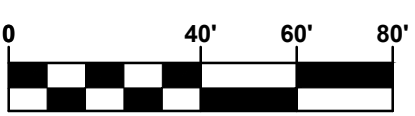
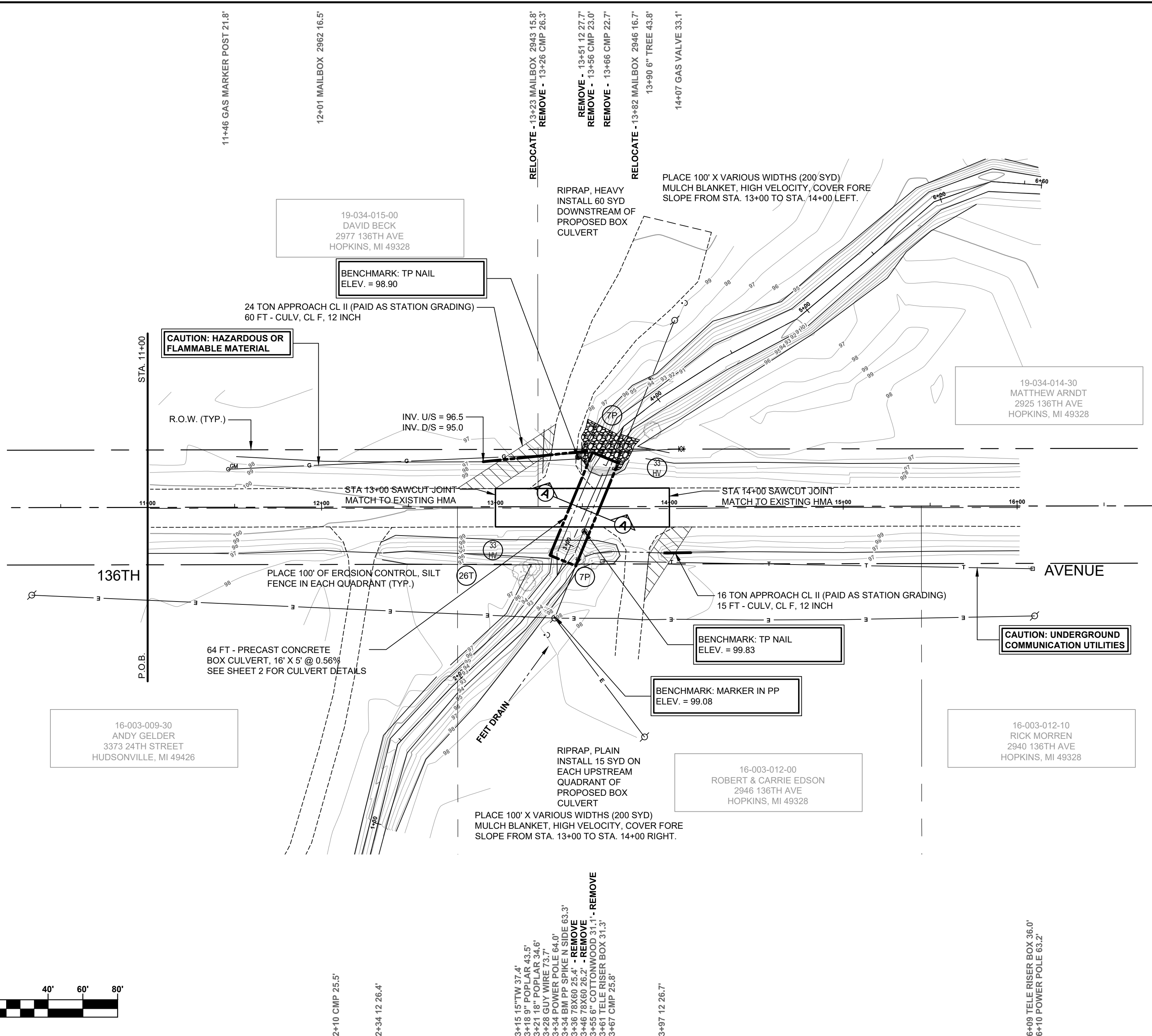
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REVISIONS						
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**136TH AVENUE CULVERT REPLACEMENTS**  
 MONTEREY & SALEM TOWNSHIP - 1,375 FT EAST OF 30TH STREET

TYPICAL SECTIONS, DETAILS, & NOTES FEIT DRAIN

DRAWN BY: RPB  
 REVIEWED BY: RPB  
 DATE: MAY, 2019  
 SCALE: AS NOTED



**SOIL EROSION & SEDIMENTATION CONTROL NOTES**

- ALL CONSTRUCTION METHODS SHALL BE DONE IN COMPLIANCE WITH THE MICHIGAN SOIL EROSION AND SEDIMENTATION CONTROL ACT. THE OWNER SHALL BE RESPONSIBLE FOR OBTAINING A "SOIL EROSION PERMIT" FROM THE COUNTY AND A "PERMIT BY RULE/NOTICE OF COVERAGE" FROM THE MDEQ PRIOR TO START OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLYING WITH ALL REQUIREMENTS OF THE COUNTY "SOIL EROSION PERMIT" AND FOR ALL CERTIFIED STORM WATER INSPECTION SERVICE REQUIRED BY THE "PERMIT BY RULE" EROSION CONTROL MEASURES SHOWN ON THE PLANS ARE THE MINIMUM REQUIREMENTS AND SHALL NOT RELIEVE THE CONTRACTOR'S RESPONSIBILITY FOR PROVIDING ALL REQUIRED EROSION CONTROL MEASURES.
  - AVOID UNNECESSARY DISTURBING OR REMOVING OF EXISTING VEGETATED TOPSOIL OR EARTH COVER, THESE COVER AREAS ACT AS SEDIMENT FILTERS.
  - ALL TEMPORARY SOIL EROSION PROTECTION SHALL REMAIN IN PLACE UNTIL REMOVAL IS REQUIRED FOR FINAL CLEAN UP AND APPROVAL.
  - GEOTEXTILE SILT FENCE SHALL BE INSTALLED AS REQUIRED WHEN CROSSING CREEKS OR WHEN ADJACENT TO WETLANDS OR SURFACE WATER BODIES TO PREVENT SILTATION AND ELSEWHERE AS DIRECTED BY THE ENGINEER. SEEDING AND/OR SODDING SHALL BE INSTALLED ON CREEK BANKS IMMEDIATELY AFTER CONSTRUCTION TO PREVENT EROSION.
  - MAINTENANCE, CLEANING, AND REMOVAL OF THE VARIOUS SEDIMENT CONTROL MEASURES SHALL BE INCLUDED IN THE VARIOUS EROSION CONTROL ITEMS.
- 3P ALL DISTURBED AREAS NOT PAVED OR GRAVELED SHALL BE RESTORED UNDER THE PAY ITEM RESTORATION (LUMP SUM). THIS PAY ITEM INCLUDES PLACING MDT SEEDING MIXTURE TUF APPLIED AT A RATE OF 220 LB/ACRE, FERTILIZER, CHEMICAL NUTRIENT, CL APPLIED AT A RATE OF 176 LB/ACRE; MULCH AT A RATE OF 2 TON/ACRE AND MULCH ANCHORING.
- 3T TEMPORARY SEEDING WILL BE PLACED AT LOCATIONS DETERMINED BY THE ENGINEER IN THE FIELD AND WILL INCLUDE SEEDING MIXTURE, OR APPLIED AT A RATE OF 70 LB/ACRE AND MULCH.
- 4T DUST CONTROL MAY BE REQUIRED ON THE SUBGRADE CONSTRUCTION AND WILL INCLUDE APPLYING FRESH WATER TO BE INCLUDED IN THE ITEM OF EMBANKMENT. DUST CONTROL ON THE AGGREGATE BASE COURSE WILL BE ACCOMPLISHED BY APPLYING FRESH WATER (INCLUDED IN THE ITEM OF AGGREGATE BASE, 6 INCH) AS DIRECTED BY THE PROJECT ENGINEER.
- 7P INSTALL RIPRAP, HEAVY AS DIRECTED BY THE ENGINEER IN THE FIELD. THE RIPRAP, HEAVY PAY ITEM WILL INCLUDE A GEOTEXTILE UNDERLAYMENT.
- 26T SILT FENCE WILL BE INSTALLED AT CREEK CROSSINGS, ADJACENT TO ALL WETLANDS AND SURFACE WATERS, AND OTHER LOCATIONS AS DIRECTED BY THE ENGINEER. EACH SILT FENCE WILL BE INSTALLED GENERALLY ALONG THE SAME CONTOUR ELEVATION.
- 3S HV HIGH VELOCITY MULCH BLANKETS WILL BE USED ON STEEP BANKS. PROVIDE MULCH BLANKET, HIGH VELOCITY CENTERED ON ALL DITCH BOTTOMS WITH A LONGITUDINAL GRADE OF 2.00% OR GREATER AND AT OTHER LOCATIONS AS DIRECTED BY THE ENGINEER IN THE FIELD.

**STAGING NOTES**

- INSTALL TEMPORARY EROSION CONTROL MEASURES.
- CONSTRUCT THE TEMPORARY CHANNEL WITH A 6A STONE PILE AT EACH END AS A PLUG. AFTER LINING THE CHANNEL WITH GEOTEXTILE, OPEN THE DOWNSTREAM PLUG, ALLOW THE WATER TO EQUALIZE, AND THEN REMOVE THE UPSTREAM PLUG.
- REMOVE THE EXISTING TWIN 6.5' X 5' CMP CULVERTS.
- INSTALL THE 16' X 5' PRECAST CONCRETE BOX CULVERT.
- OPEN THE CHANNEL FROM THE DOWN STREAM END AND ALLOW THE WATER TO EQUALIZE. OPEN THE UPSTREAM SIDE OF THE NEW CHANNEL AND PLUG THE TEMPORARY CHANNEL.
- BACKFILL THE TEMPORARY CHANNEL AND PRECAST CONCRETE BOX.
- INSTALL PERMANENT SOIL EROSION CONTROL MEASURES.

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**136TH AVENUE CULVERT REPLACEMENTS**  
MONTEREY & SALEM TOWNSHIP - 1,375 FT EAST OF 30TH STREET - FEIT DRAIN  
**PLAN & PROFILE AND SOIL EROSION & SEDIMENTATION CONTROL PLAN**

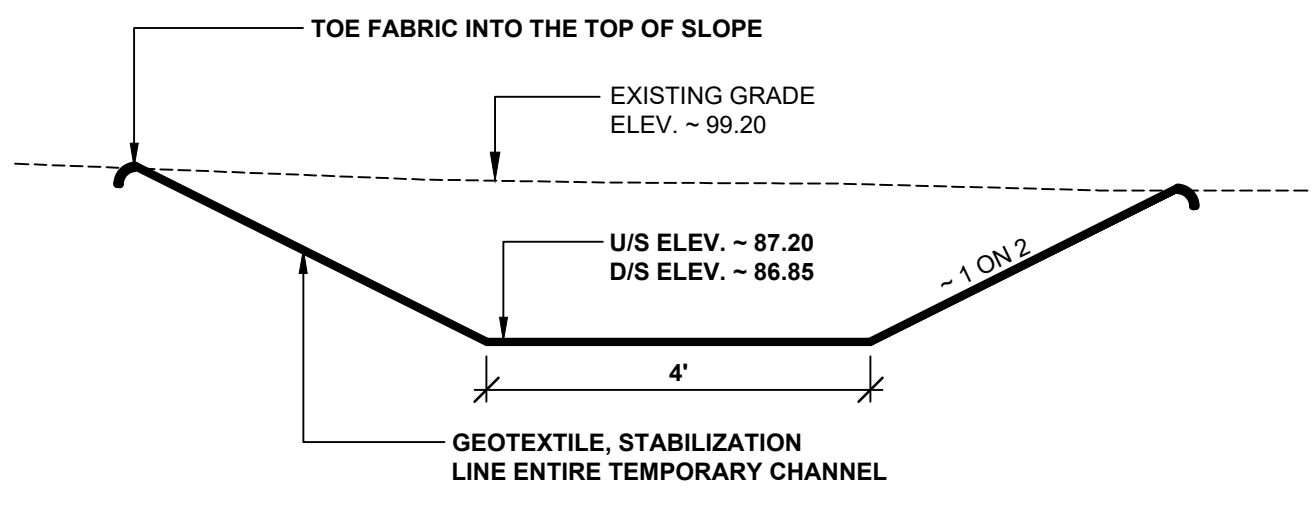
DRAWN BY: RPB  
REVIEWED BY: JSE  
DATE: MAY, 2019  
SCALE: 1" = 40'H, 5'V

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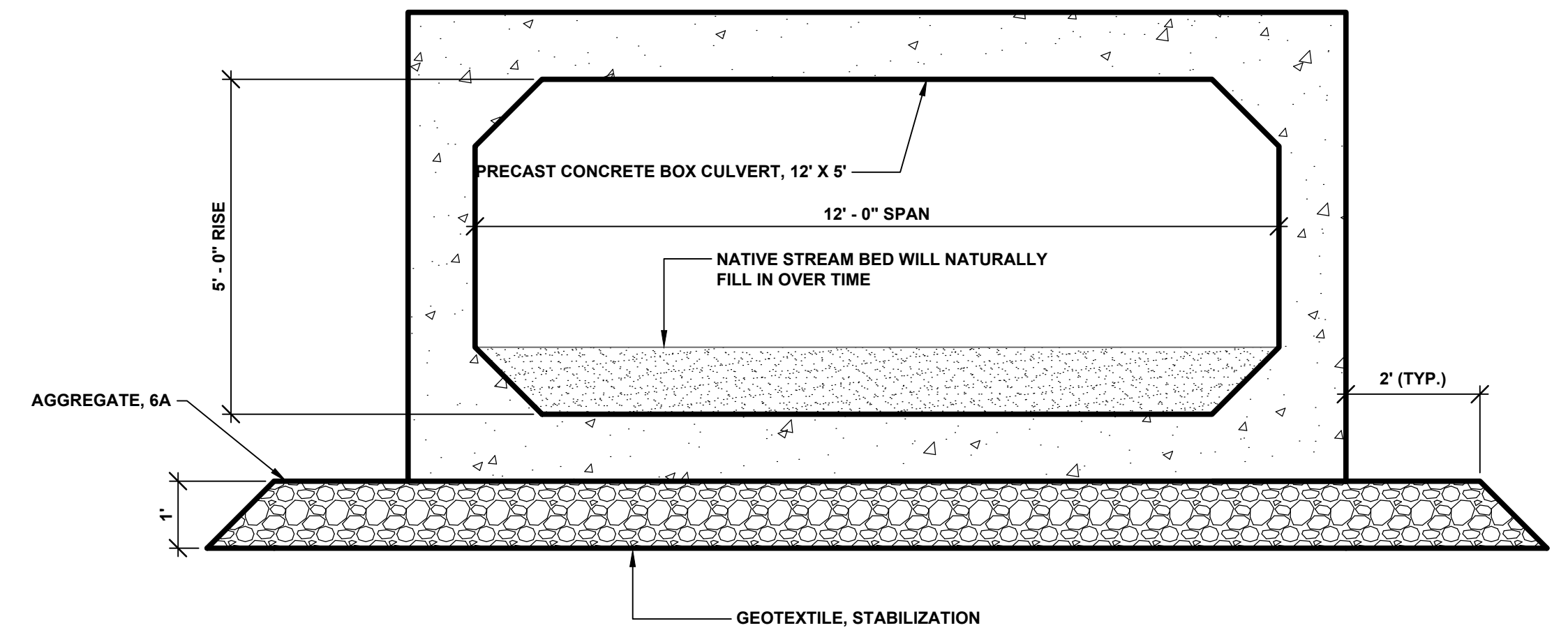
**136TH AVENUE CULVERT REPLACEMENTS**  
MONTEREY & SALEM TOWNSHIP - 2,955 FT EAST OF 30TH STREET

TYPICAL SECTIONS, DETAILS, & NOTES PICKEL DRAIN

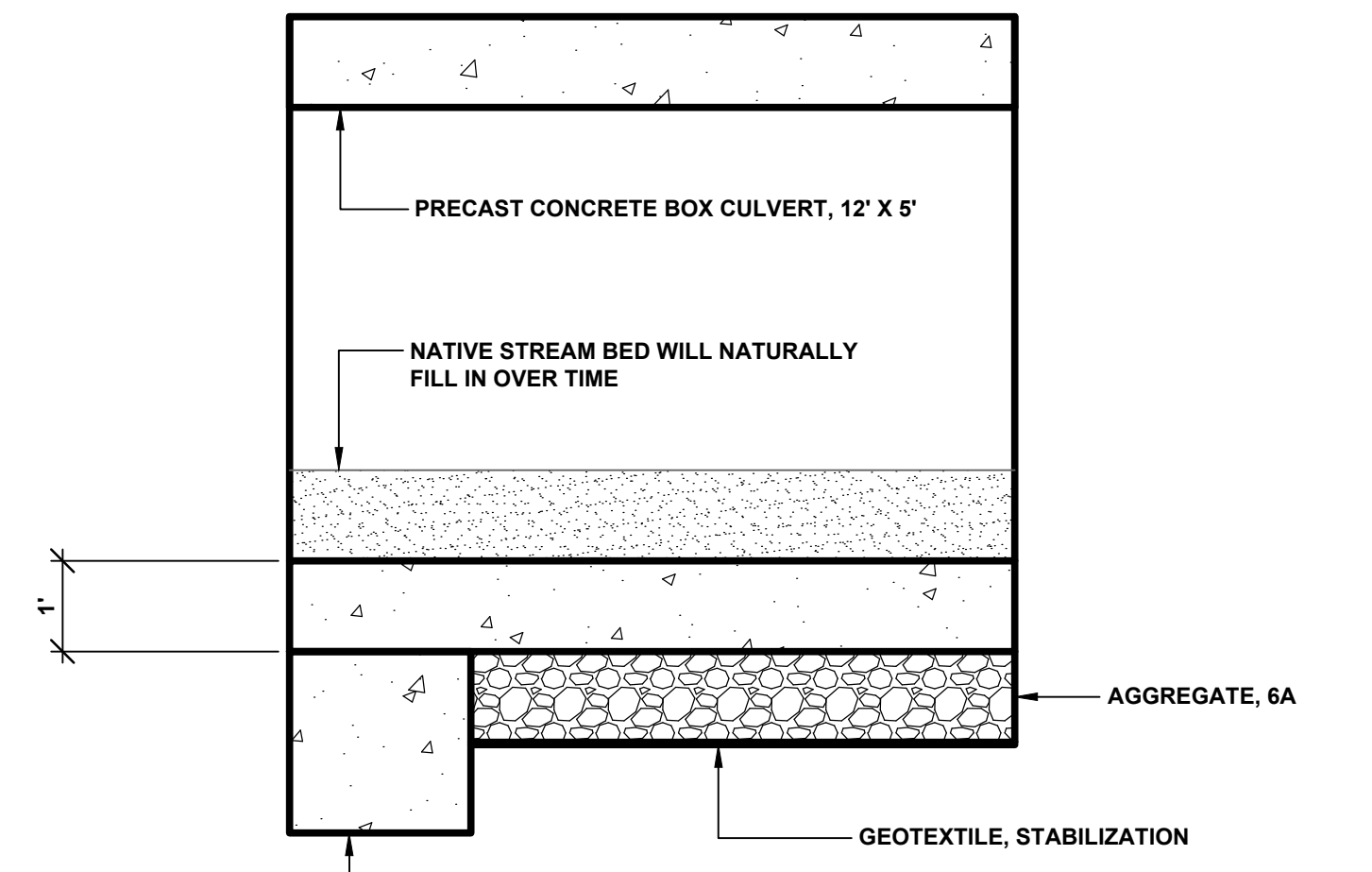
DRAWN BY:	
REVIEWED BY:	RPB
DATE:	MAY, 2019
SCALE:	AS NOTED



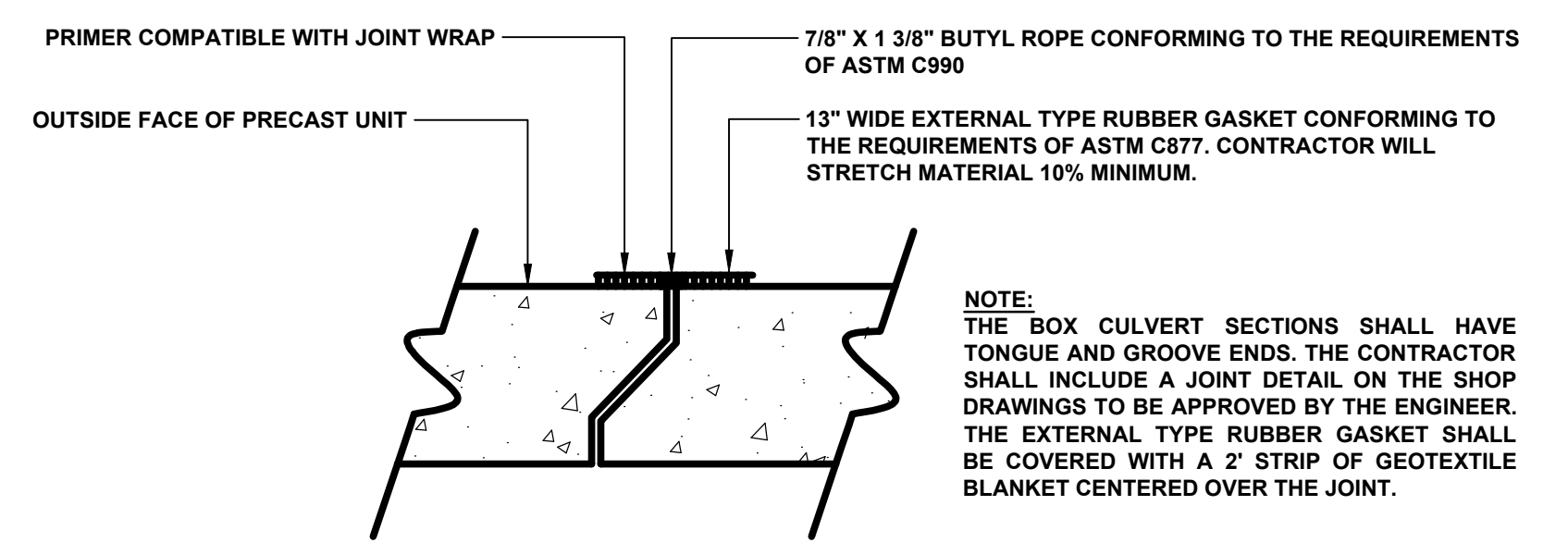
**TEMPORARY CHANNEL CROSS SECTION**  
SCALE 1" = 2'



**SECTION A - A**  
SCALE 1" = 2'

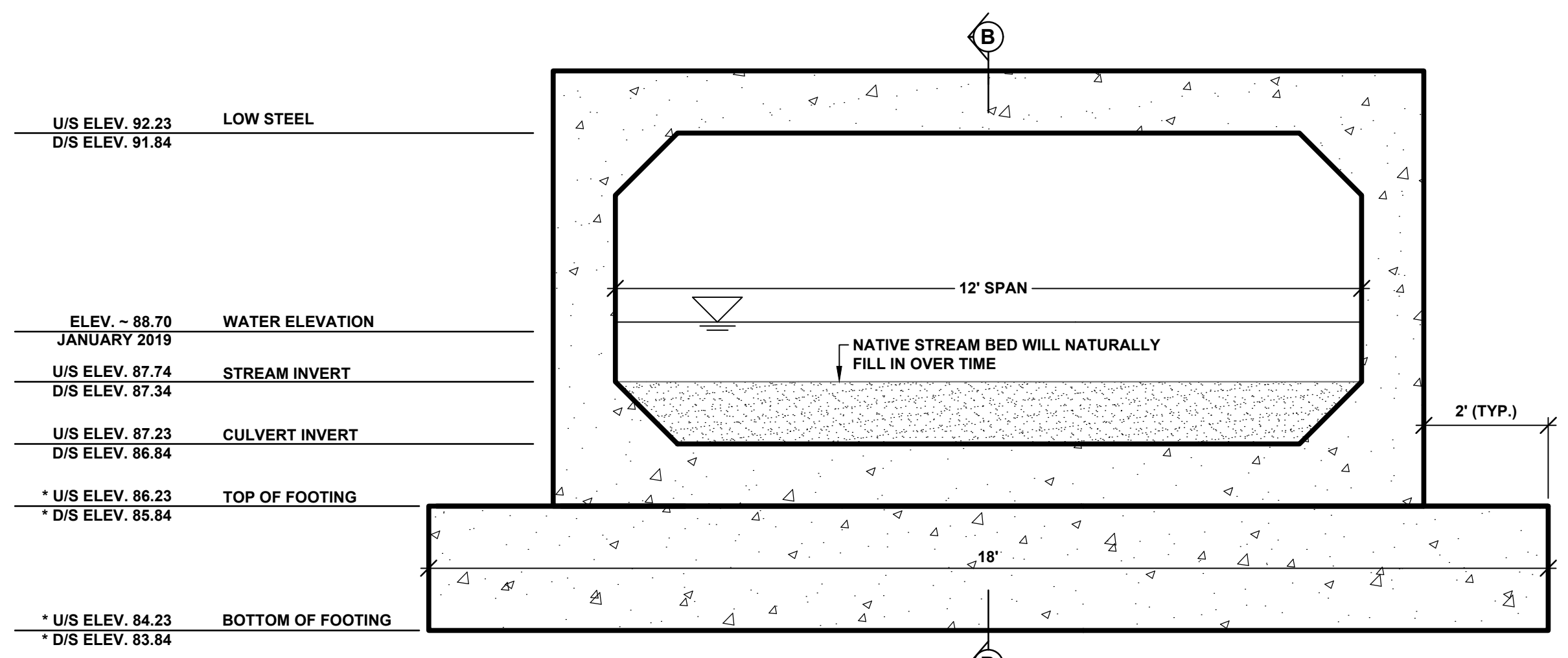


**SECTION B - B**  
SCALE 1" = 2'

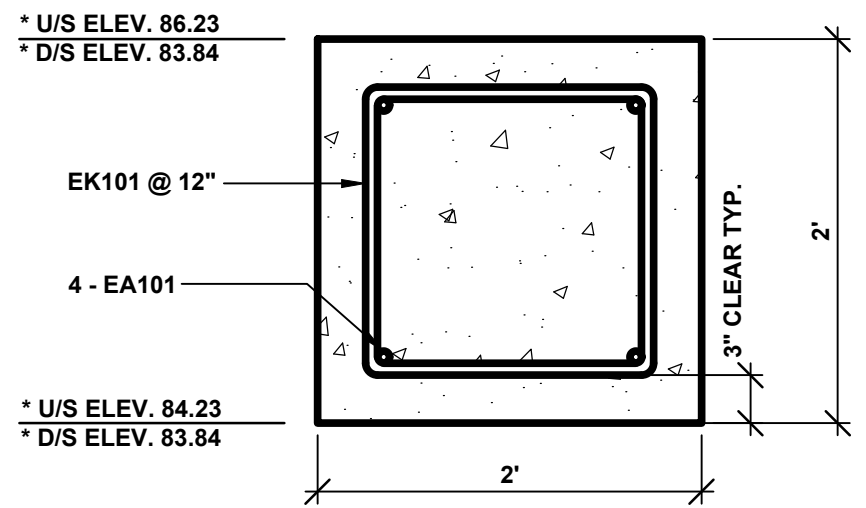


**TYPICAL JOINT SEAL DETAIL**

NOTE:  
THE BOX CULVERT SECTIONS SHALL HAVE TONGUE AND GROOVE ENDS. THE CONTRACTOR SHALL INCLUDE A JOINT DETAIL ON THE SHOP DRAWINGS TO BE APPROVED BY THE ENGINEER. THE EXTERNAL TYPE RUBBER GASKET SHALL BE COVERED WITH A 2' STRIP OF GEOTEXTILE BLANKET CENTERED OVER THE JOINT.



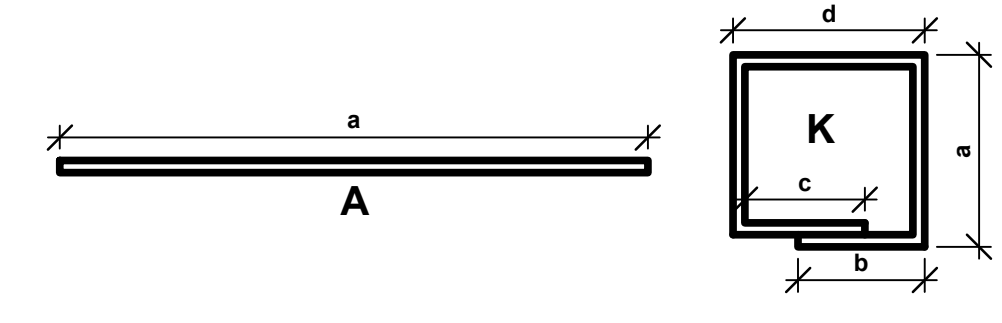
**TYPICAL INLET AND OUTLET SECTION PICKEL DRAIN**  
SCALE 1" = 2'



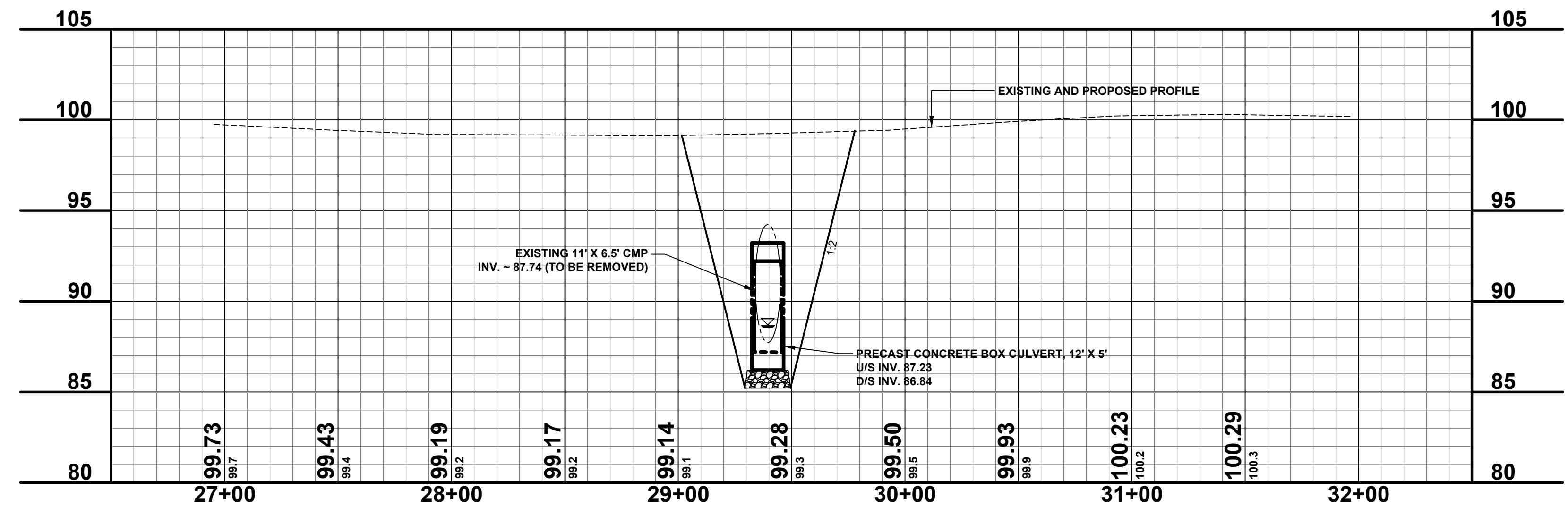
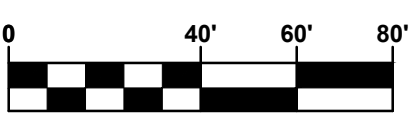
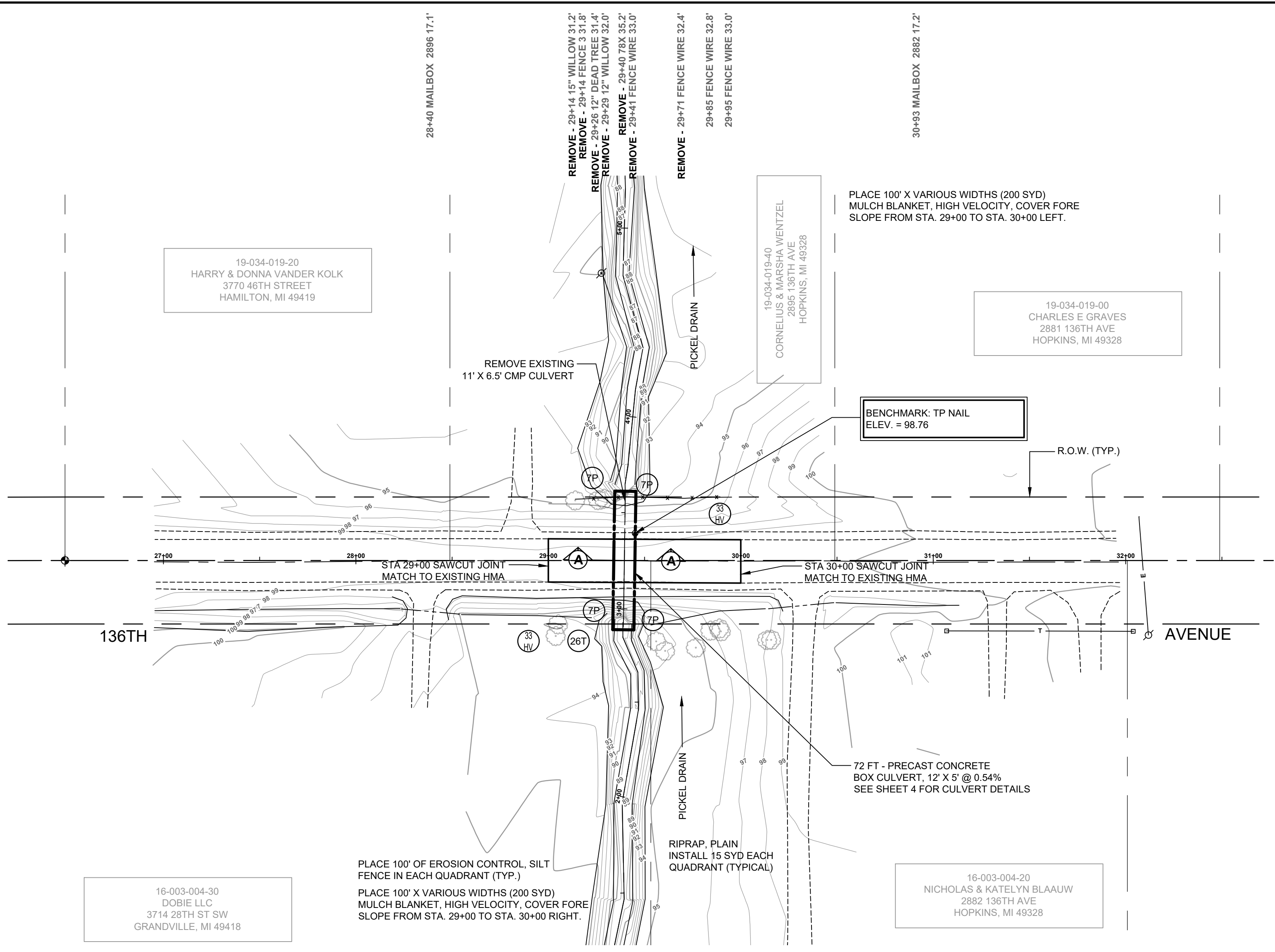
**FOOTING DETAIL**  
SCALE 1" = 1'

STEEL REINFORCEMENT SCHEDULE								
BAR	a	b	c	d	SIZE	LENGTH	NO. REQUIRED	TOTAL WEIGHT
EA101	17' - 6"				#6	17' - 6"	8	258
EK101	1' - 6"	1' - 0"	1' - 0"	1' - 6"	#6	6' - 6"	38	371

NOTES:  
ALL RIGHT ANGLE BENDS IN REINFORCING STEEL TO BE MADE ABOUT A PIN OF THE MINIMAL DIAMETER ALLOWED BY THE STANDARD SPECIFICATIONS.  
THE CONTRACTOR IS RESPONSIBLE FOR CHECKING THE ABOVE REINFORCING STEEL QUANTITIES AND LENGTHS PRIOR TO ORDERING DELIVERY OF STEEL.  
STEEL REINFORCEMENT WITH BAR DESIGNATIONS BEGINNING WITH THE LETTER "E" WILL BE EPOXY COATED.



\* NOTE:  
INVERT ELEVATION OF BOX CULVERT GOVERNS. TOP OF FOOTING & BOTTOM OF FOOTING ELEVATIONS MAY VARY BASED UPON THE MANUFACTURER'S CULVERT DESIGN. CONTRACTOR IS RESPONSIBLE FOR ADJUSTING THE FOOTING ACCORDINGLY.



**SOIL EROSION & SEDIMENTATION CONTROL NOTES**

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  - AVOID UNNECESSARY DISTURBING OR REMOVING OF EXISTING VEGETATED TOPSOIL OR EARTH COVER, THESE COVER AREAS ACT AS SEDIMENT FILTERS.
  - ALL TEMPORARY SOIL EROSION PROTECTION SHALL REMAIN IN PLACE UNTIL REMOVAL IS REQUIRED FOR FINAL CLEAN UP AND APPROVAL.
  - GEOTEXTILE SILT FENCE SHALL BE INSTALLED AS REQUIRED WHEN CROSSING CREEKS OR WHEN ADJACENT TO WETLANDS OR SURFACE WATER BODIES TO PREVENT SILTATION AND ELSEWHERE AS DIRECTED BY THE ENGINEER. SEEDING AND/OR SODDING SHALL BE INSTALLED ON CREEK BANKS IMMEDIATELY AFTER CONSTRUCTION TO PREVENT EROSION.
  - MAINTENANCE, CLEANING, AND REMOVAL OF THE VARIOUS SEDIMENT CONTROL MEASURES SHALL BE INCLUDED IN THE VARIOUS EROSION CONTROL ITEMS.
- 3P ALL DISTURBED AREAS NOT PAVED OR GRAVELED SHALL BE RESTORED UNDER THE PAY ITEM RESTORATION (LUMP SUM). THIS PAY ITEM INCLUDES PLACING MDT SEEDING, MIXTURE TUF APPLIED AT A RATE OF 220 LB/ACRE, FERTILIZER, CHEMICAL NUTRIENT, CL APPLIED AT A RATE OF 176 LB/ACRE; MULCH AT A RATE OF 2 TON/ACRE AND MULCH ANCHORING.
- 3T TEMPORARY SEEDING WILL BE PLACED AT LOCATIONS DETERMINED BY THE ENGINEER IN THE FIELD AND WILL INCLUDE SEEDING MIXTURE, OR APPLIED AT A RATE OF 70 LB/ACRE AND MULCH.
- 4T DUST CONTROL MAY BE REQUIRED ON THE SUBGRADE CONSTRUCTION AND WILL INCLUDE APPLYING FRESH WATER TO BE INCLUDED IN THE ITEM OF EMBANKMENT. DUST CONTROL ON THE AGGREGATE BASE COURSE WILL BE ACCOMPLISHED BY APPLYING FRESH WATER (INCLUDED IN THE ITEM OF AGGREGATE BASE, 6 INCH) AS DIRECTED BY THE PROJECT ENGINEER.
- 7P INSTALL RIPRAP, PLAIN AS DIRECTED BY THE ENGINEER IN THE FIELD. THE RIPRAP, PLAIN PAY ITEM WILL INCLUDE A GEOTEXTILE UNDERLAYMENT.
- 26T SILT FENCE WILL BE INSTALLED AT CREEK CROSSINGS, ADJACENT TO ALL WETLANDS AND SURFACE WATERS, AND OTHER LOCATIONS AS DIRECTED BY THE ENGINEER. EACH SILT FENCE WILL BE INSTALLED GENERALLY ALONG THE SAME CONTOUR ELEVATION.
- 33 HV HIGH VELOCITY MULCH BLANKETS WILL BE USED ON STEEP BANKS. PROVIDE MULCH BLANKET, HIGH VELOCITY CENTERED ON ALL DITCH BOTTOMS WITH A LONGITUDINAL GRADE OF 2.00% OR GREATER AND AT OTHER LOCATIONS AS DIRECTED BY THE ENGINEER IN THE FIELD.

**STAGING NOTES**

- INSTALL TEMPORARY EROSION CONTROL MEASURES.
- CONSTRUCT THE TEMPORARY CHANNEL WITH A 6A STONE PILE AT EACH END AS A PLUG. AFTER LINING THE CHANNEL WITH GEOTEXTILE, OPEN THE DOWNSTREAM PLUG, ALLOW THE WATER TO EQUALIZE, AND THEN REMOVE THE UPSTREAM PLUG.
- REMOVE THE EXISTING 11' X 6.5' CMP CULVERT.
- INSTALL THE 12' X 5' PRECAST CONCRETE BOX CULVERT.
- OPEN THE CHANNEL FROM THE DOWN STREAM END AND ALLOW THE WATER TO EQUALIZE. OPEN THE UPSTREAM SIDE OF THE NEW CHANNEL AND PLUG THE TEMPORARY CHANNEL.
- BACKFILL THE TEMPORARY CHANNEL AND PRECAST CONCRETE BOX.
- INSTALL PERMANENT SOIL EROSION CONTROL MEASURES.

**Board of County Road Commissioners  
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1308 LINCOLN ROAD  
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**136TH AVENUE CULVERT REPLACEMENTS**  
MONTEREY & SALEM TOWNSHIP - 2,955 FT EAST OF 30TH STREET - PICKEL DRAIN  
**PLAN & PROFILE AND SOIL EROSION & SEDIMENTATION CONTROL PLAN**

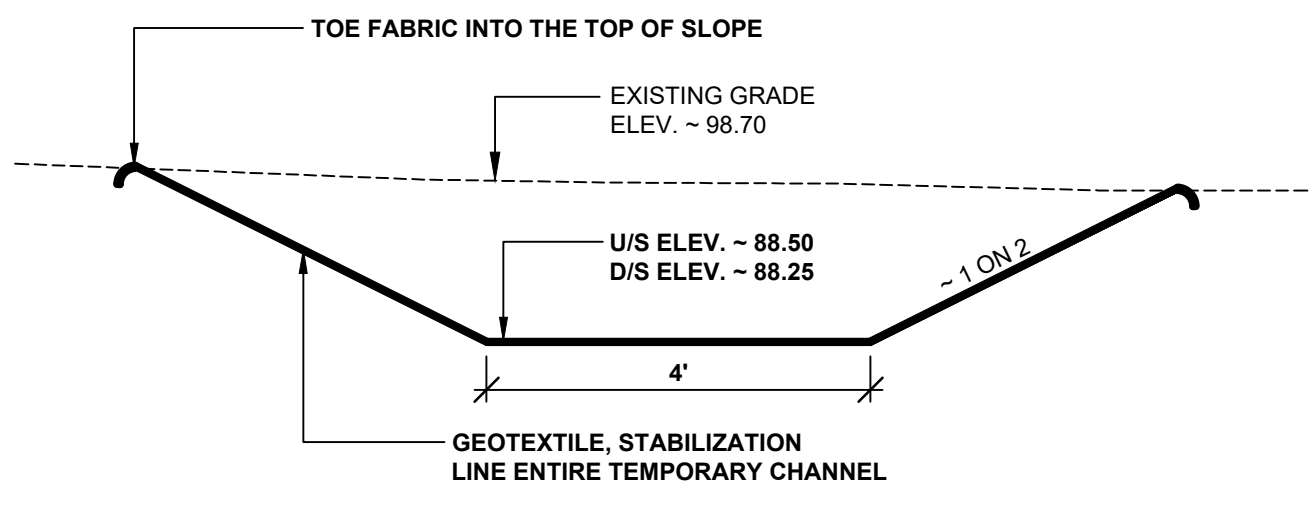
DRAWN BY: RPB  
REVIEWED BY: JSE  
DATE: MAY, 2019  
SCALE: 1" = 40'H, 5'V

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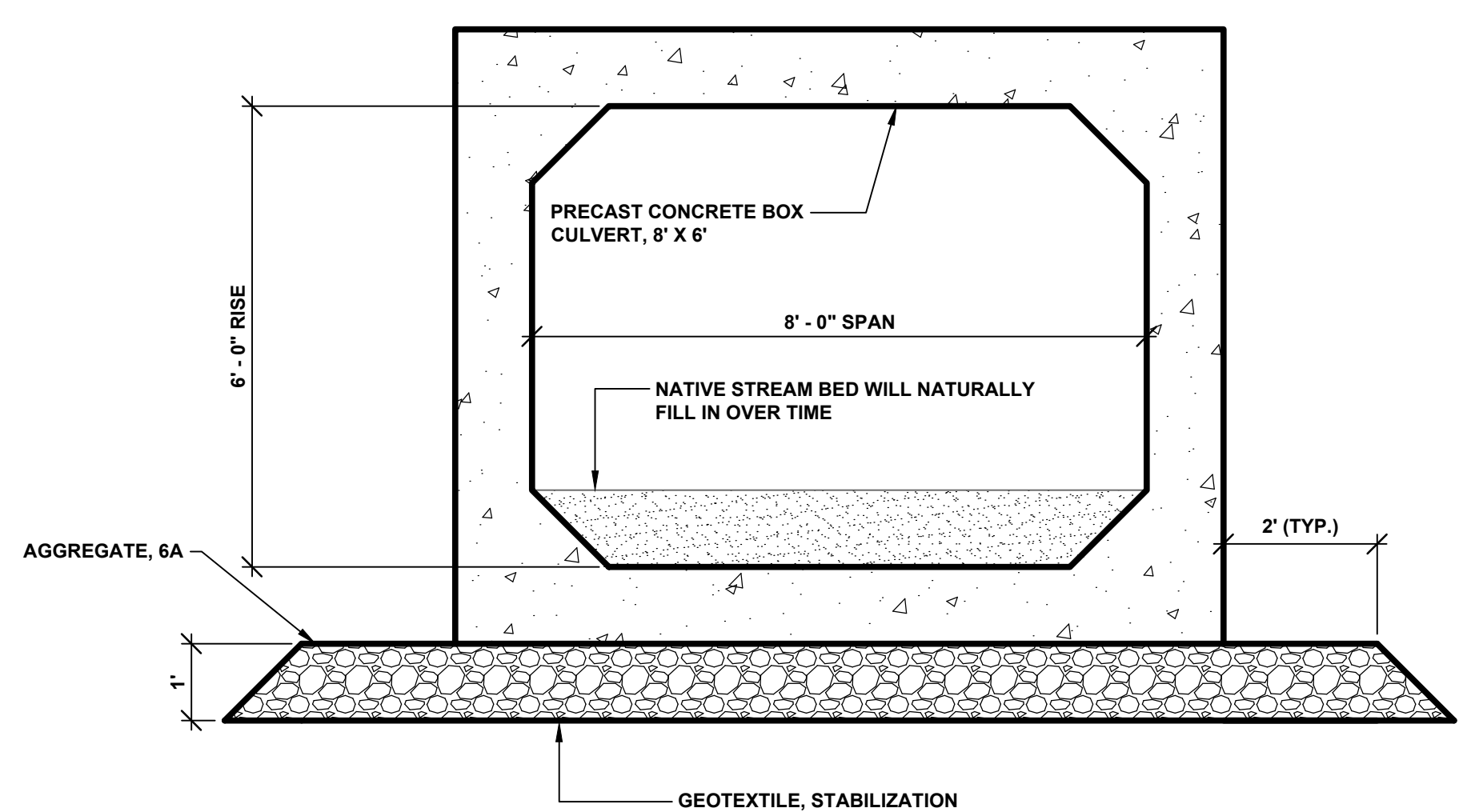
**136TH AVENUE CULVERT REPLACEMENTS**  
MONTEREY & SALEM TOWNSHIP - 4,365 FT EAST OF 30TH STREET

TYPICAL SECTIONS, DETAILS, & NOTES MOORED DRAIN

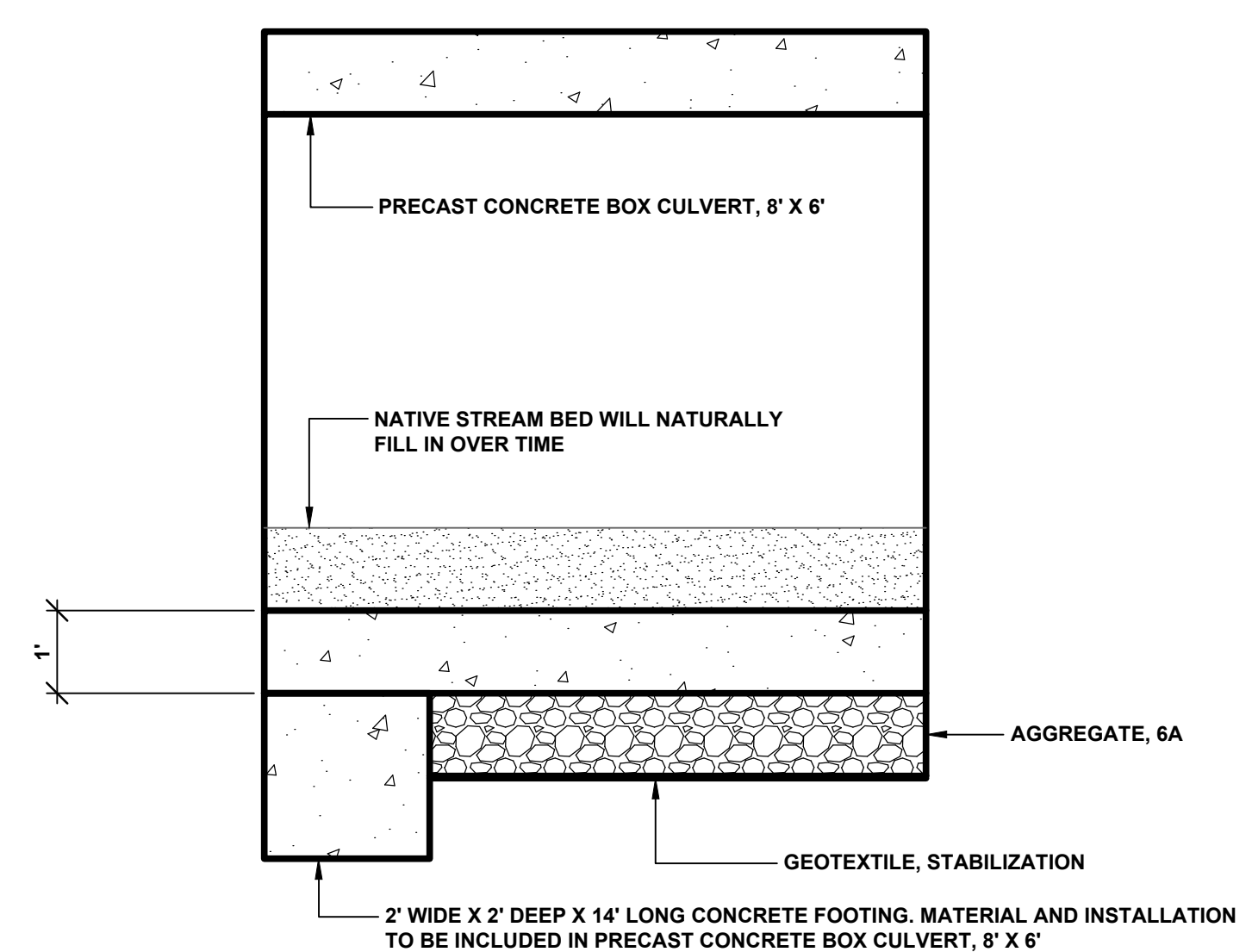
DRAWN BY:	
REVIEWED BY:	RPB
DATE:	MAY, 2019
SCALE:	AS NOTED



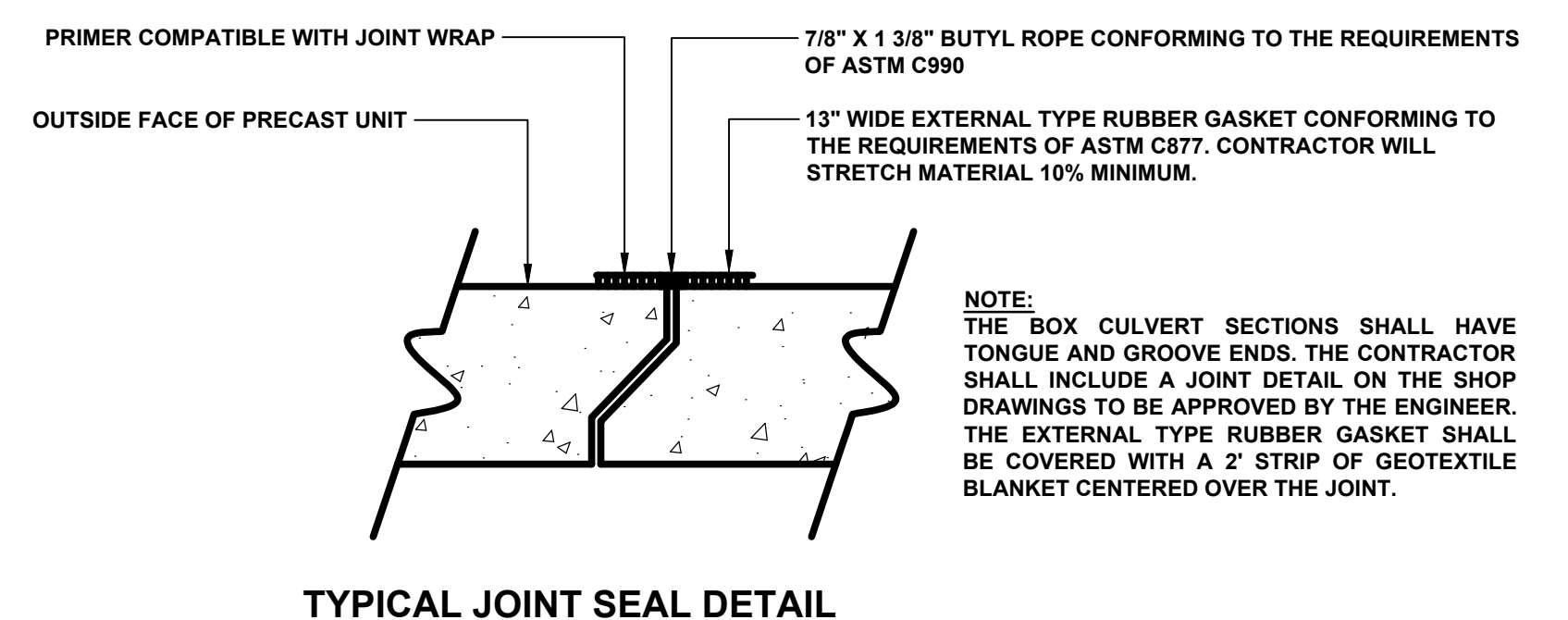
**TEMPORARY CHANNEL CROSS SECTION**  
SCALE 1" = 2'



**SECTION A - A**  
SCALE 1" = 2'

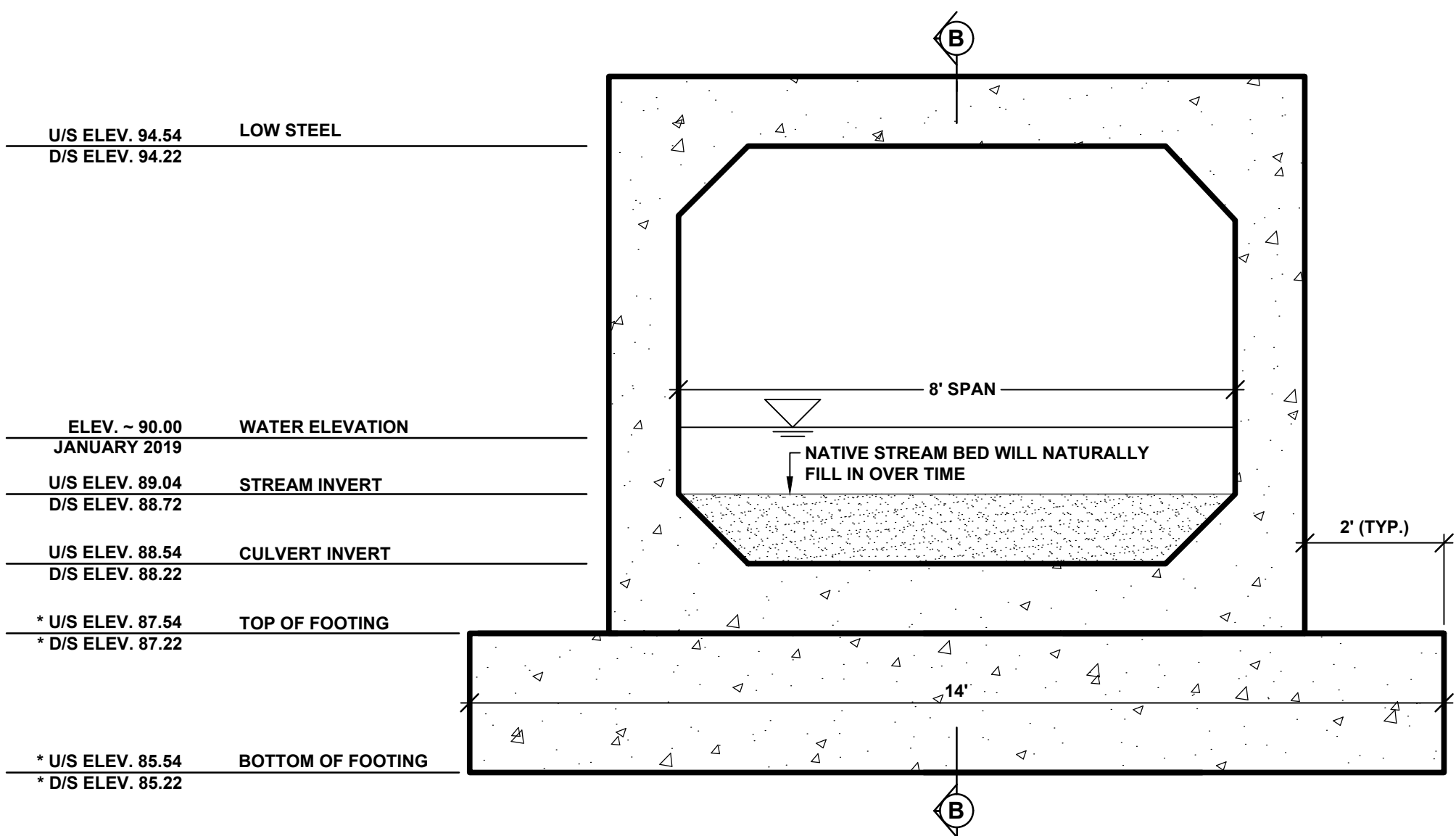


**SECTION B - B**  
SCALE 1" = 2'



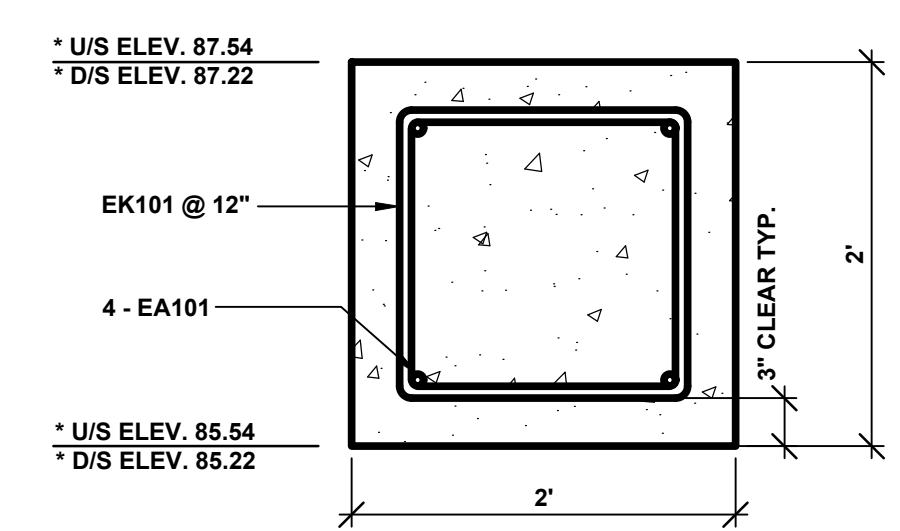
**TYPICAL JOINT SEAL DETAIL**

NOTE:  
THE BOX CULVERT SECTIONS SHALL HAVE TONGUE AND GROOVE ENDS. THE CONTRACTOR SHALL INCLUDE A JOINT DETAIL ON THE SHOP DRAWINGS TO BE APPROVED BY THE ENGINEER. THE EXTERNAL TYPE RUBBER GASKET SHALL BE COVERED WITH A 2' STRIP OF GEOTEXTILE BLANKET CENTERED OVER THE JOINT.



**TYPICAL INLET AND OUTLET SECTION MOORED DRAIN**  
SCALE 1" = 2'

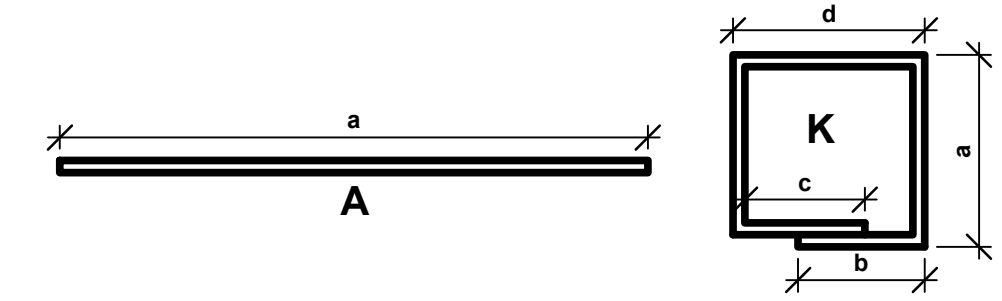
\* NOTE:  
INVERT ELEVATION OF BOX CULVERT GOVERNS. TOP OF FOOTING & BOTTOM OF FOOTING ELEVATIONS MAY VARY BASED UPON THE MANUFACTURER'S CULVERT DESIGN. CONTRACTOR IS RESPONSIBLE FOR ADJUSTING THE FOOTING ACCORDINGLY.

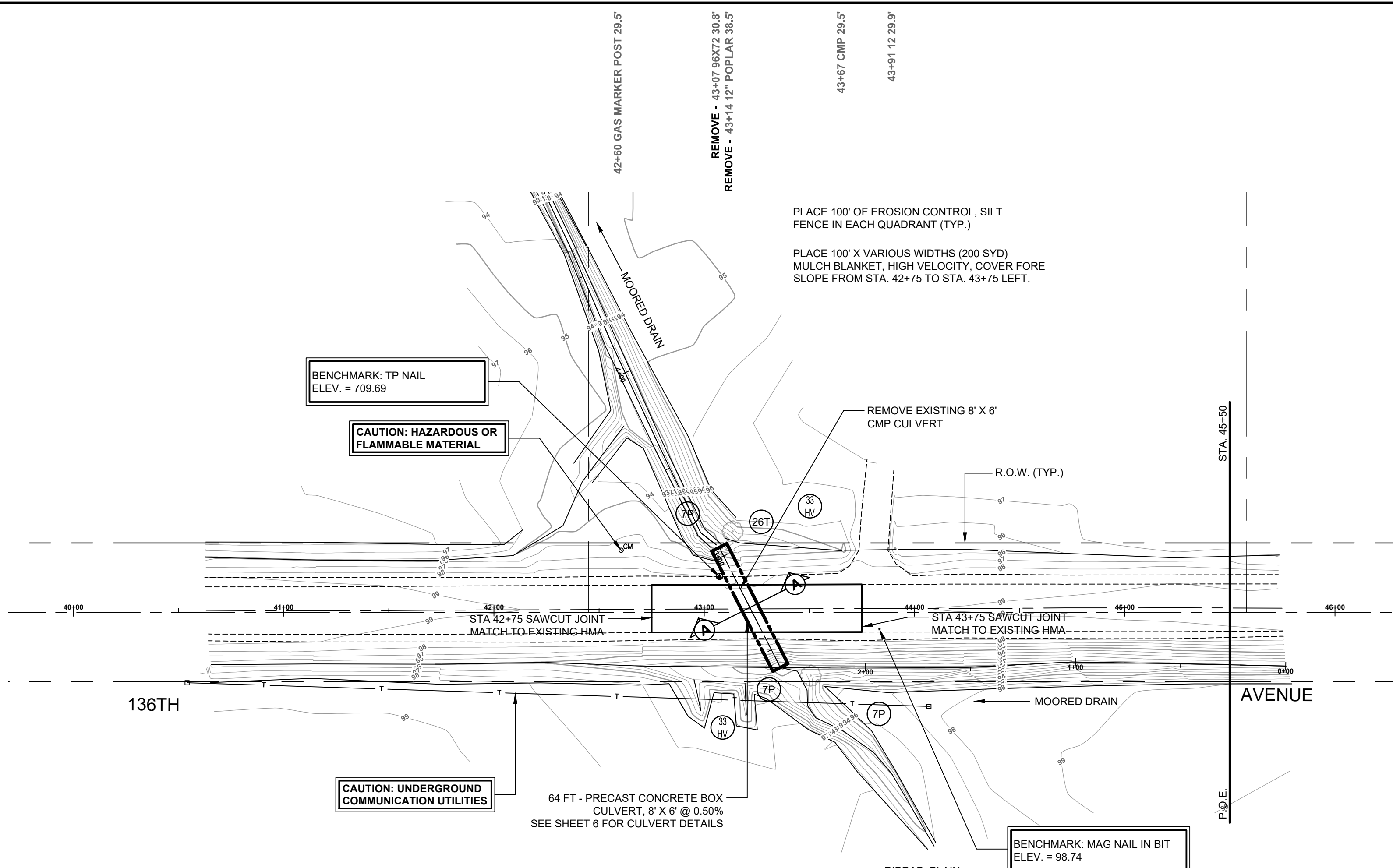


**FOOTING DETAIL**  
SCALE 1" = 1'

STEEL REINFORCEMENT SCHEDULE								
BAR	a	b	c	d	SIZE	LENGTH	NO. REQUIRED	TOTAL WEIGHT
EA101	13' - 6"				#6	13' - 6"	8	162
EK101	1' - 6"	1' - 0"	1' - 0"	1' - 6"	#6	6' - 6"	30	293

NOTES:  
ALL RIGHT ANGLE BENDS IN REINFORCING STEEL TO BE MADE ABOUT A PIN OF THE MINIMAL DIAMETER ALLOWED BY THE STANDARD SPECIFICATIONS.  
THE CONTRACTOR IS RESPONSIBLE FOR CHECKING THE ABOVE REINFORCING STEEL QUANTITIES AND LENGTHS PRIOR TO ORDERING DELIVERY OF STEEL.  
STEEL REINFORCEMENT WITH BAR DESIGNATIONS BEGINNING WITH THE LETTER "E" WILL BE EPOXY COATED.



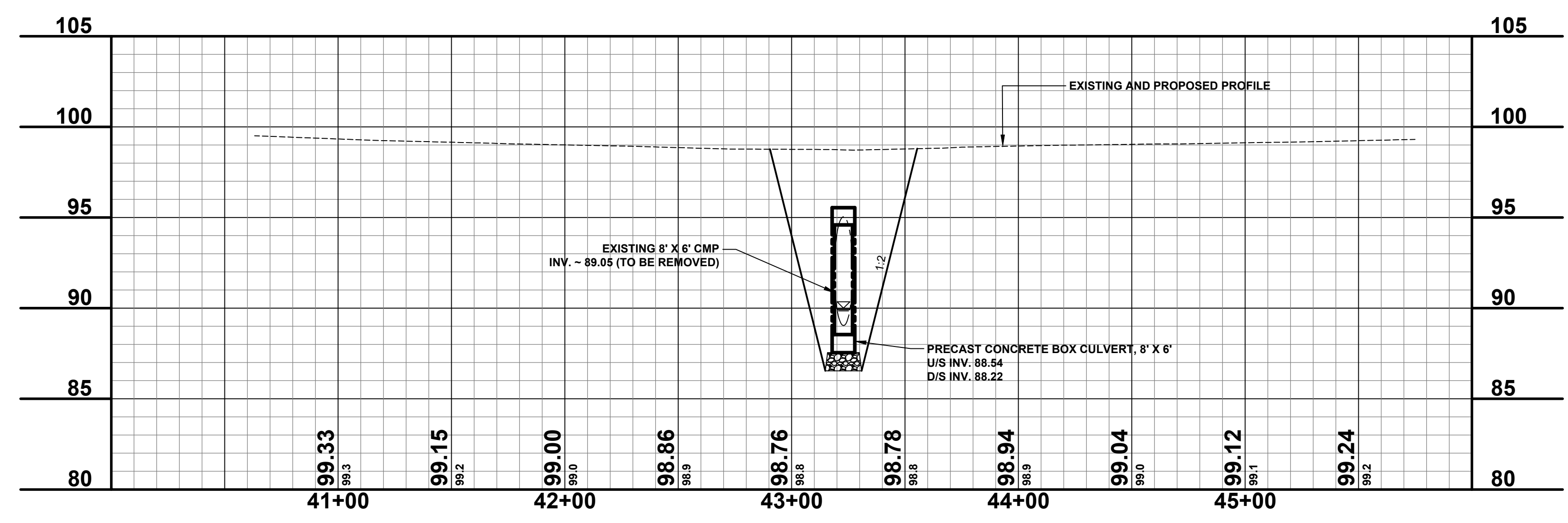
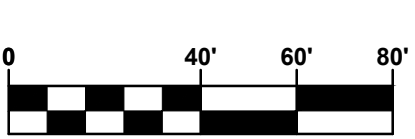


**SOIL EROSION & SEDIMENTATION CONTROL NOTES**

- ALL CONSTRUCTION METHODS SHALL BE DONE IN COMPLIANCE WITH THE MICHIGAN SOIL EROSION AND SEDIMENTATION CONTROL ACT. THE OWNER SHALL BE RESPONSIBLE FOR OBTAINING A "SOIL EROSION PERMIT" FROM THE COUNTY AND A "PERMIT BY RULE/NOTICE OF COVERAGE" FROM THE MDEQ PRIOR TO START OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLYING WITH ALL REQUIREMENTS OF THE COUNTY "SOIL EROSION PERMIT" AND FOR ALL CERTIFIED STORM WATER INSPECTION SERVICE REQUIRED BY THE "PERMIT BY RULE". EROSION CONTROL MEASURES SHOWN ON THE PLANS ARE THE MINIMUM REQUIREMENTS AND SHALL NOT RELIEVE THE CONTRACTOR'S RESPONSIBILITY FOR PROVIDING ALL REQUIRED EROSION CONTROL MEASURES.
  - AVOID UNNECESSARY DISTURBING OR REMOVING OF EXISTING VEGETATED TOPSOIL OR EARTH COVER, THESE COVER AREAS ACT AS SEDIMENT FILTERS.
  - ALL TEMPORARY SOIL EROSION PROTECTION SHALL REMAIN IN PLACE UNTIL REMOVAL IS REQUIRED FOR FINAL CLEAN UP AND APPROVAL.
  - GEOTEXTILE SILT FENCE SHALL BE INSTALLED AS REQUIRED WHEN CROSSING CREEKS OR WHEN ADJACENT TO WETLANDS OR SURFACE WATER BODIES TO PREVENT SILTATION AND ELSEWHERE AS DIRECTED BY THE ENGINEER. SEEDING AND/OR SODDING SHALL BE INSTALLED ON CREEK BANKS IMMEDIATELY AFTER CONSTRUCTION TO PREVENT EROSION.
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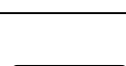



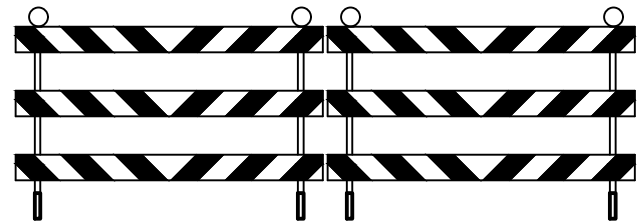

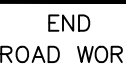
**STAGING NOTES**

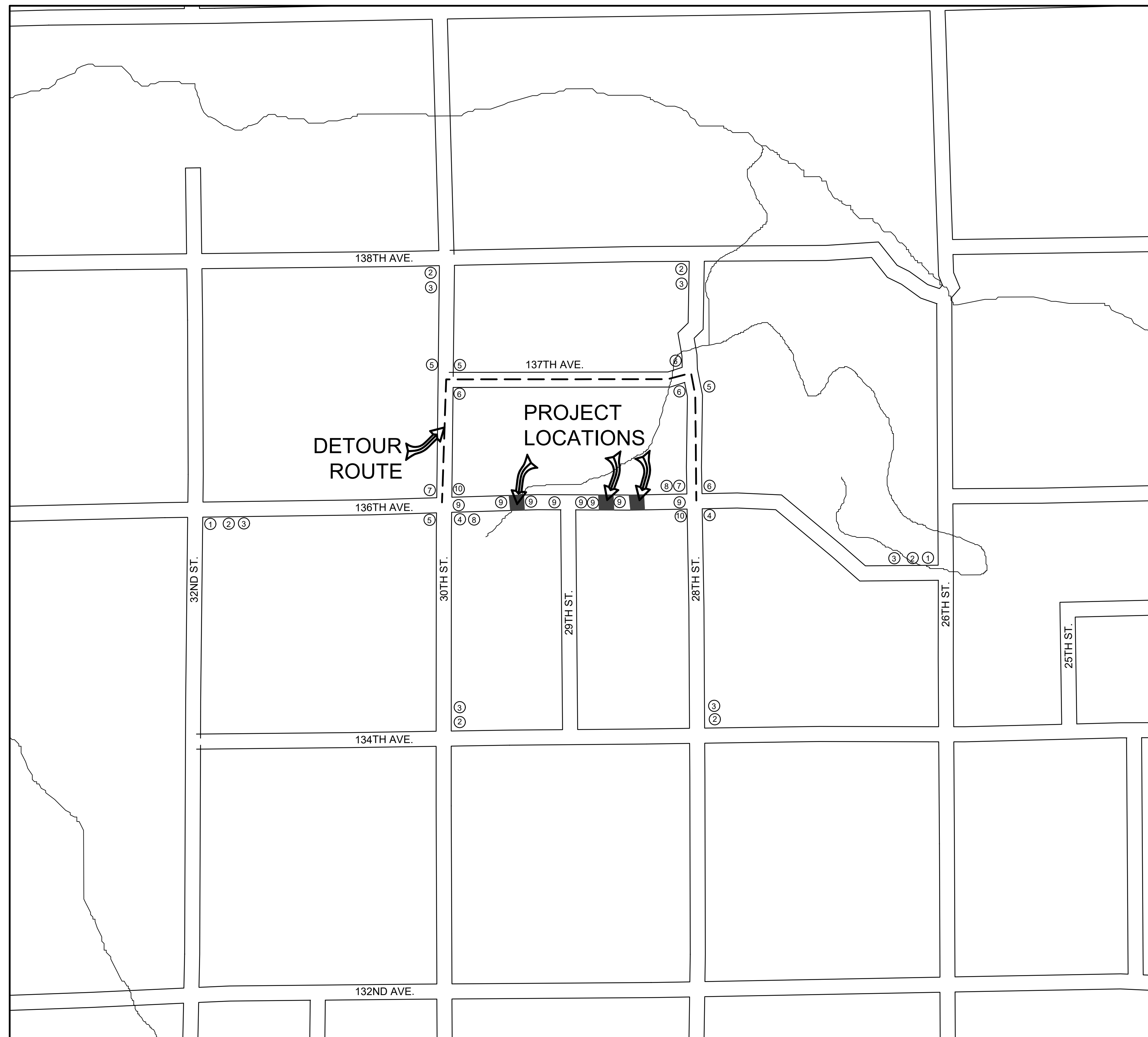
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- REMOVE THE EXISTING 8' X 6' CMP CULVERT.
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DRAWN BY: RPB  
REVIEWED BY: JSE  
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LEGEND					
SIGN NO.	QTY.	SIGN DESIGNATION	DESCRIPTION	SIZE	AREA
①	2 EA	W20-1		48 INCH x 48 INCH	32 SFT
②	6 EA	W20-3		48 INCH x 48 INCH	96 SFT
		D3-2a		36 INCH x 12 INCH	18 SFT
③	6 EA	W20-2		48 INCH x 48 INCH	96 SFT
④	2 EA	M4-9		30 INCH x 24 INCH	10 SFT
		D3-2a		36 INCH x 12 INCH	6 SFT
⑤	4 EA	M4-9		30 INCH x 24 INCH	20 SFT
		D3-2a		36 INCH x 12 INCH	12 SFT
⑥	4 EA	M4-9		30 INCH x 24 INCH	20 SFT
		D3-2a		36 INCH x 12 INCH	12 SFT
⑦	2 EA	D3-2a		36 INCH x 12 INCH	6 SFT
		M4-8a		24 INCH x 18 INCH	6 SFT
⑧	2 EA	R5-18c		48 INCH x 48 INCH	32 SFT
⑨	8 EA	BARRICADE, TYPE III, HIGH INTENSITY, LIGHTED, 2 REQUIRED EACH LOCATION		2 REQUIRED EACH LOCATION	16 EA
		R11-4		60 INCH x 30 INCH	100 SFT
⑩	2 EA	G20-2		48 INCH x 24 INCH	16 SFT
				TOTAL AREA =	498 SFT



A PORTION OF SALEM AND MONTEREY TOWNSHIPS  
 ALLEGAN COUNTY, MI  
 NOT TO SCALE

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**136TH AVENUE CULVERT REPLACEMENTS**  
 MONTEREY & SALEM TOWNSHIP - 1,375, 2,955, & 4,365 FT EAST OF 30TH STREET  
 DETOUR ROUTE

DRAWN BY: RPB  
 REVIEWED BY: JSE  
 DATE: MAY 2019  
 SCALE: NONE