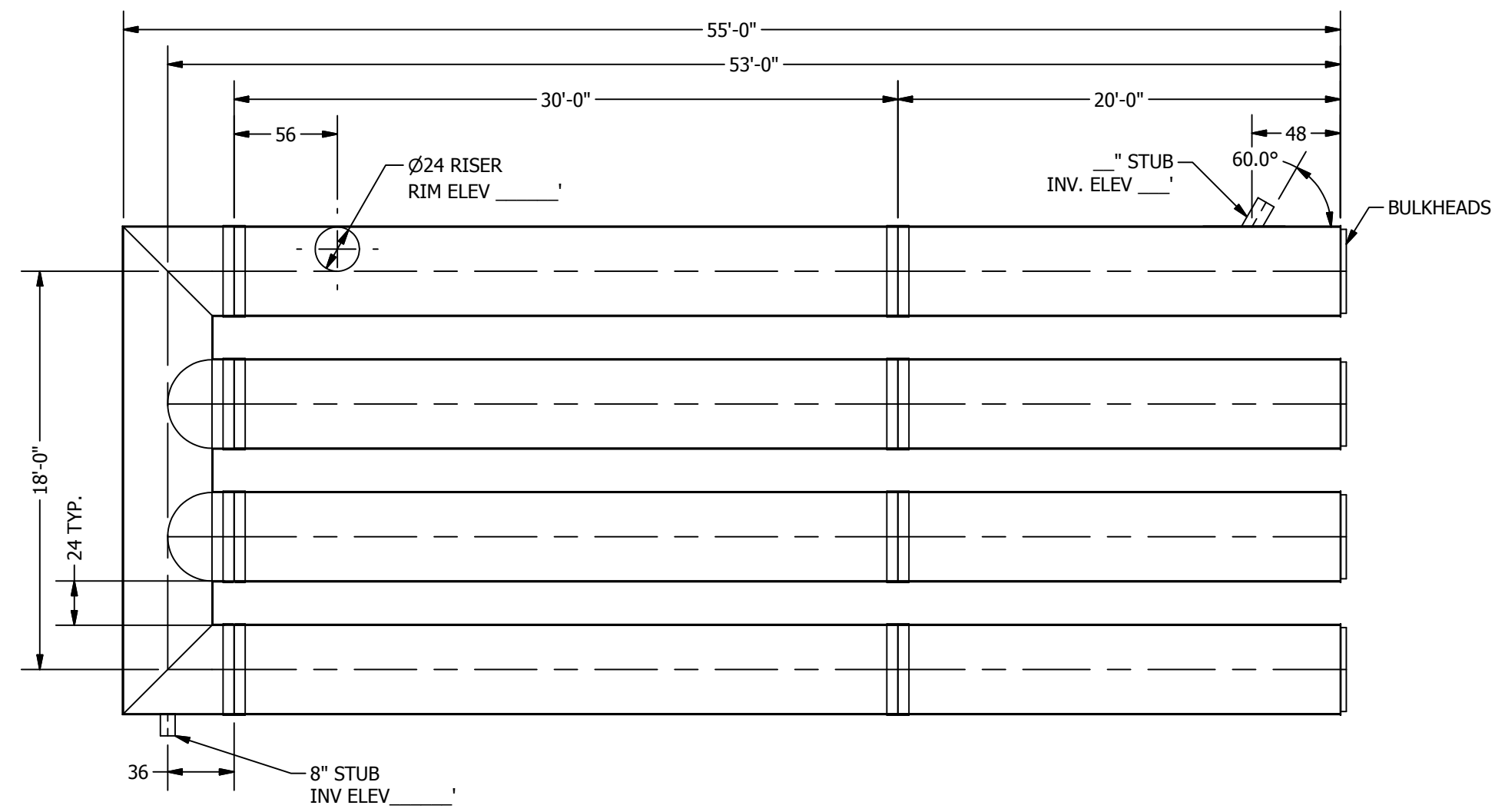


QC	LAYOUT	DIM. INSP.:	WELDER:	WELD INSP.:	COATING:	COAT. INSP.:	COMP. DATE:	HEAT #:



NOTES:

1. ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF STUBS AND RISERS SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION
2. ALL RISERS AND STUBS ARE STANDARD 16 GA 2 2/3"X 1/2" CORRUGATIONS U.O.N.
3. ALL DIMENSIONS ARE TO CENTERLINE OR NOMINAL PIPE ID WHERE APPLICABLE
4. RISERS TO BE FEILD TRIMMED TO GRADE AS NEEDED
5. ALL FITTINGS AND REINFORCEMENTS SHALL COMPLY WITH ASTM A998
6. REFER TO "TNS Underground Detention/Retention Standard Specification" DOCUMENT FOR APPLICABLE STANDARDS

Select or fill in the following:

PRIMARY SYSTEM DIAMETER: _____"	PIPE WALL / APPLICATION
PRIMARY MAT'L GAUGE: 16Ga 14Ga 12Ga 10Ga 8Ga	DETENTION SOLID RETENTION PERFORATED
PRIMARY STEEL MAT'L COATING GALV. T2 AL. POLY.	SYSTEM INVERT: _____'
SYSTEM VOLUME = _____ CU FT (EST.)	DESIGN LOADING: H20/H25

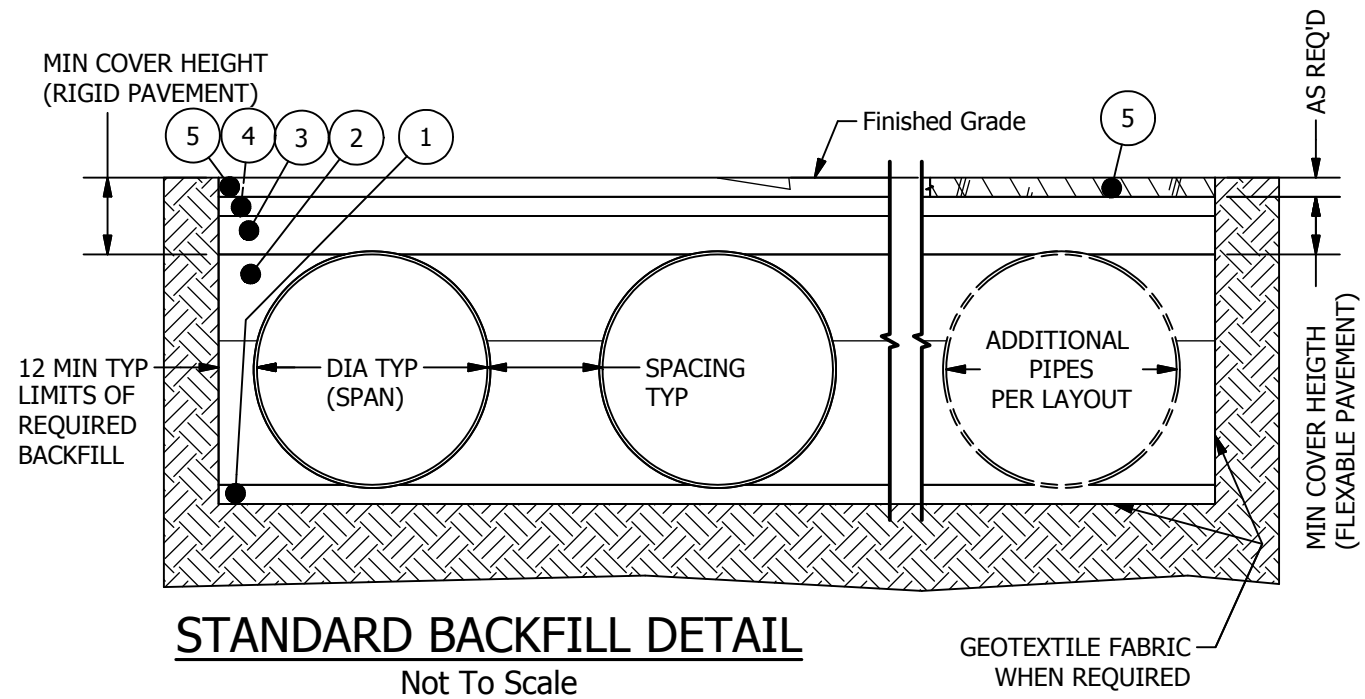
THIS DESIGN IS PROPERTY OF TRUENORTH STEEL. DUPLICATION WITHOUT WRITTEN PERMISSIONS IS STRICTLY PROHIBITED	

ECN #	A	5/7/2015	FOR INTERNAL REVIEW	DMA
REV		DATE	DESCRIPTION	BY
REVISIONS				

DRAWING IS NOT TO SCALE ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED ALL WELDS MUST REPAIRED AFTER FABRICATION (PER ASTM 760) PIPE LENGTHS HAVE A TOLERANCE OF ± 2" PIPE DIAMETERS HAVE A TOLERANCE OF THE GREATER OF ± 1/2" or 1% ALL ANGLES HAVE A TOLERANCE OF ± 3°	TOLERANCES ± 1/4" UNLESS OTHERWISE NOTED	CUSTOMER APPROVAL SIGNATURE DATE
--	--	-------------------------------------

DRAWN BY: DMA	PART#: Template layout
DATE: 7/18/2016	WEIGHT: 0.000 lbmass
CHECKED:	MATERIAL: SEE BOM
CHK DATE:	JOB# QTY: SHEET NO: 1 OF 3

QC	LAYOUT	DIM. INSP.:	WELDER:	WELD INSP.:	COATING:	COAT. INSP.:	COMP. DATE:	HEAT #:
CONSTRUCTION TYP								
SHOP MARK	DESCRIPTION		REMARKS					
1	Granular Bedding		Roughly shaped to Bottom of pipe, 4" to 6" depth U.O.N.					
2	Select Granular Backfill or Washed Angular Stone Per Eng		Per AASHTO M145 A1, A2, A3 or approved equal Placed in 8" loose lifts compacted to min 90% standard density per AASHTO T99					
3	Backfill Crown to Min required cover		12" Min for diameters thru 96" 18" Min for diameters 102"+ From top of rigid pavement or bottom of flexable pavement U.O.N.					
4	Granular Road Base		Per Project Engineer					
5	Flexible or Rigid Pavement		Per Project Engineer					



FOUNDATION/BEDDING PREPARATION:

PRIOR TO PLACING THE BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION. THEY SHALL BE REMOVED AND BROUGHT BACK TO THE GRADE WITH A FILL MATERIAL APPROVED BY THE ENGINEER. ONCE THE FOUNDATION PREPARATION IS COMPLETE, 4 INCHES OF WELL GRADED GRANULAR MATERIAL SHALL BE PLACED AS THE BEDDING.

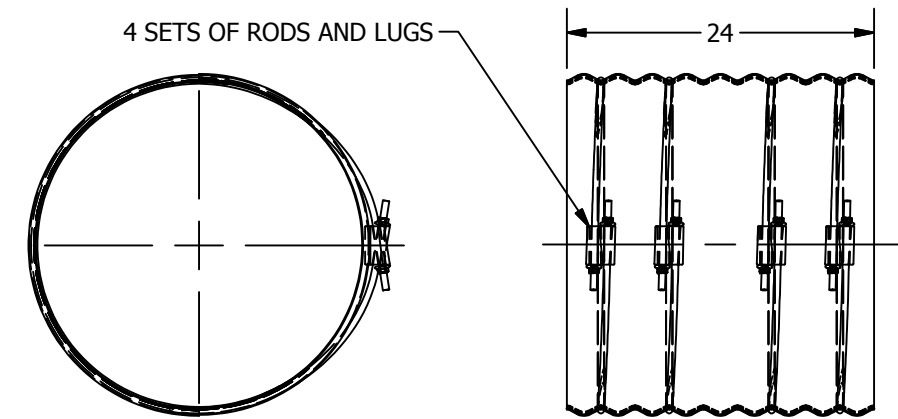
BACKFILL:

THE BACKFILL SHALL BE AN A1, A2 OR A3 GRANULAR FILL PER AASHTO M 145 OR A WELL GRADED GRANULAR FILL AS APPROVED BY THE ENGINEER. THE MATERIAL SHALL BE PLACED IN 8 INCH LOOSE LIFTS AND COMPACTED TO 90% AASHTO T99 STANDARD PROCTOR DENSITY. WHEN PLACING THE FIRST LIFTS OF BACKFILL IT IS IMPORTANT TO MAKE SURE THAT THE BACKFILL IS PROPERLY COMPACTED UNDER AND AROUND THE PIPE HAUNCHES. BACKFILL SHALL BE PLACED SUCH THAT THERE IS NO MORE THAN A TWO LIFT DIFFERENTIAL BETWEEN ANY OF THE PIPES AT ANY TIME DURING THE BACKFILL PROCESS. THE BACKFILL SHALL BE ADVANCED ALONG THE LENGTH OF THE PIPE AT THE SAME RATE TO AVOID DIFFERENTIAL LOADING OF THE PIPE.

OTHER ALTERNITIVE BACKFILL MAY BE ALLOWED AS APPROVED BY SITE ENGINEER

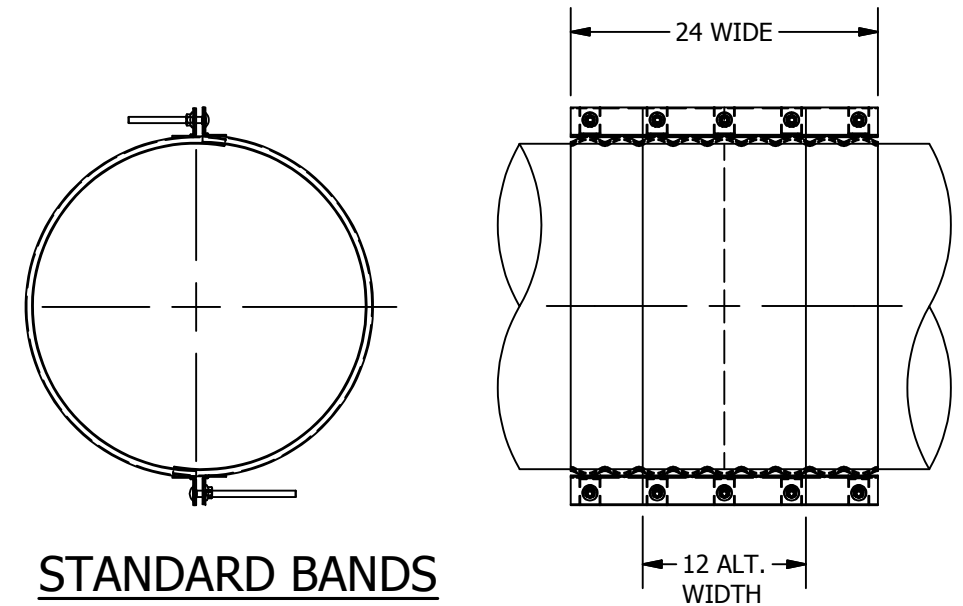
MINIMUM COVER:

BACKFILL SHALL BE PLACED TO THE PROPER ELEVATION AS OUTLINED IN THE PLANS. MINIMUM COVER FOR CONSTRUCTION LOADING NEEDS TO BE DETERMINED BASED ON THE TYPE OF EQUIPMENT THAT IS PLANNED FOR CONSTRUCTION. PROPER COVER FOR CONSTRUCTION EQUIPMENT SHALL BE DETERMINED PRIOR TO THE PRE-CONSTRUCTION MEETING BY THE ENGINEER.



ROD AND LUG BANDS

BANDS TWO PEICE
24" WIDE



STANDARD BANDS

BANDS TWO PEICE
24" WIDE AND 12" SHOWN

BAND NOTES

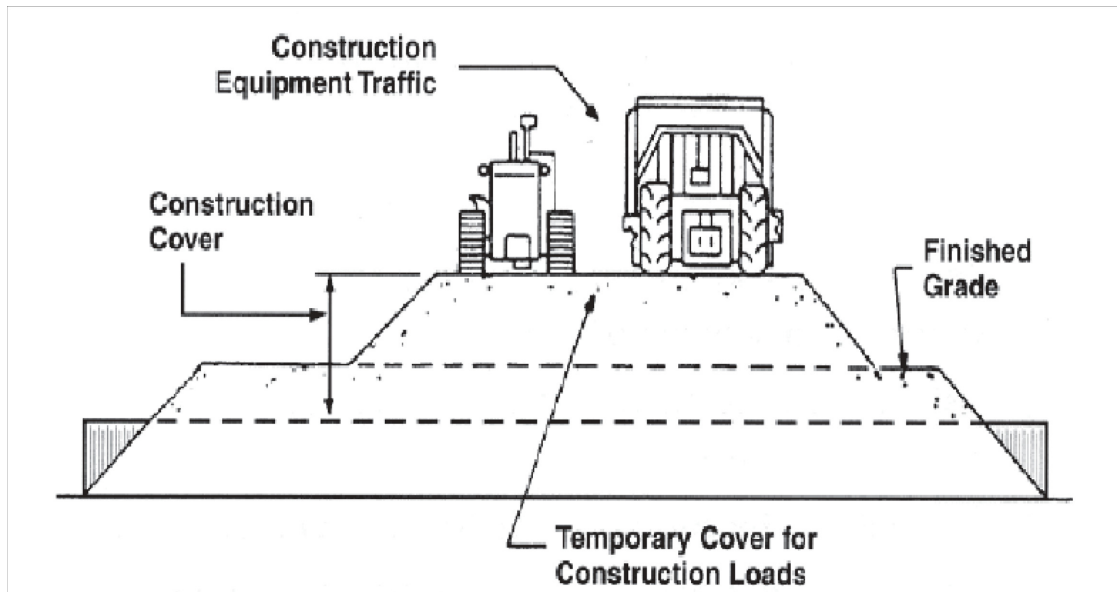
1. BANDS TO BE CENTERED ON EACH PIPE JOINT
2. FOR DETENTION SYSTEM - BANDS CAN BE PROVIDED WITH 3/8" THICK, 12 OR 24 WIDE OPEN CELL NEOPRENE GASKETS ASTM D1056
3. FOR RETENTION SYSTEM - TNS RECOMMENDS TWO PEICE BAND MIN 12" WIDE NO GASKET REQUIRED
4. OTHER BANDS NOT SHOWN AVAILABLE UPON REQUEST/APPLICATION

THIS DESIGN IS PROPERTY OF TRUENORTH STEEL. DUPLICATION WITHOUT WRITTEN PERMISSIONS IS STRICTLY PROHIBITED.			
DESCRIPTION:			
DRAWN BY: DMA	PART#: Template sketch backfill		
DATE: 7/18/2016	WEIGHT: N/A		
CHECKED:	MATERIAL:		
CHK DATE:	JOB#	QTY:	SHEET NO: 2 OF 3

ECN #	A	5/7/2015	FOR INTERNAL REVIEW	DMA
	REV	DATE	DESCRIPTION	BY
REVISIONS				

DRAWING IS NOT TO SCALE ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED ALL WELDS MUST REPAIRED AFTER FABRICATION (PER ASTM 760) PIPE LENGTHS HAVE A TOLERANCE OF ± 2" PIPE DIAMETERS HAVE A TOLERANCE OF THE GREATER OF ± 1/2" or 1% ALL ANGLES HAVE A TOLERANCE OF ± 3°		TOLERANCES ± 1/4" UNLESS OTHERWISE NOTED	CUSTOMER APPROVAL SIGNATURE DATE
--	--	--	-------------------------------------

QC	LAYOUT	DIM. INSP.:	WELDER:	WELD INSP.:	COATING:	COAT. INSP.:	COMP. DATE:	HEAT #:



Guidelines for minimum cover for heavy off-road construction equipment.				
Span (in)	18-50		110-150	
	Min. Cover (ft) for Axle Loads (kips)			
	50-75	75-110		
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

1) Min. crossing width of twice the span is recommended.
2) Additional cover may be needed depending on local conditions.

*FROM NCSA DESIGN MANUAL

CONSTRUCTION LOADS:

TEMPORARY CONSTRUCTION VEHICLE LOADS MAY BE HIGHER THAN FINAL VEHICLE LOADS. AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. HEIGHT OF COVER SHALL MEET MINIMUM REQUIREMENTS SHOWN IN TABLE BELOW TO ENSURE PIPE INTEGRITY.

*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

THIS DESIGN IS PROPERTY OF TRUENORTH STEEL DUPLICATION WITHOUT WRITTEN PERMISSIONS IS STRICTLY PROHIBITED	
---	---

DESCRIPTION:	
DRAWN BY: DMA	PART#: Template layout
DATE: 7/18/2016	WEIGHT: 0.000 lbmass
CHECKED:	MATERIAL:
CHK DATE:	JOB# QTY: SHEET NO: 3 OF 3

DRAWING IS NOT TO SCALE ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED ALL WELDS MUST REPAIRED AFTER FABRICATION (PER ASTM 760) PIPE LENGTHS HAVE A TOLERANCE OF ± 2" PIPE DIAMETERS HAVE A TOLERANCE OF THE GREATER OF ± 1/2" or 1% ALL ANGLES HAVE A TOLERANCE OF ± 3°	TOLERANCES	CUSTOMER APPROVAL SIGNATURE
	± 1/4" UNLESS OTHERWISE NOTED	

ECN #	REV	DATE	DESCRIPTION	BY
	A	5/7/2015	FOR INTERNAL REVIEW	DMA
REVISIONS				