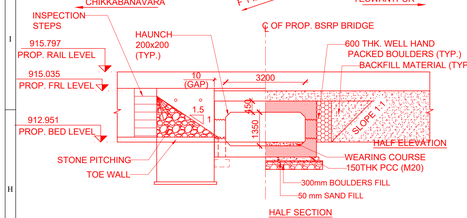
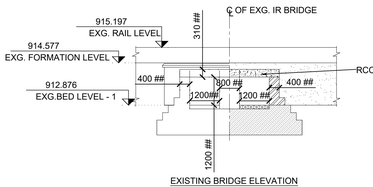
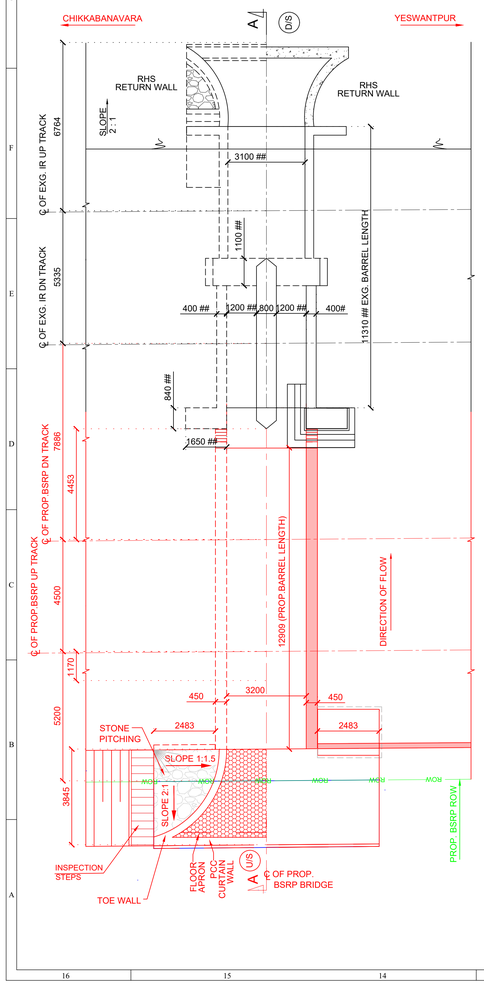
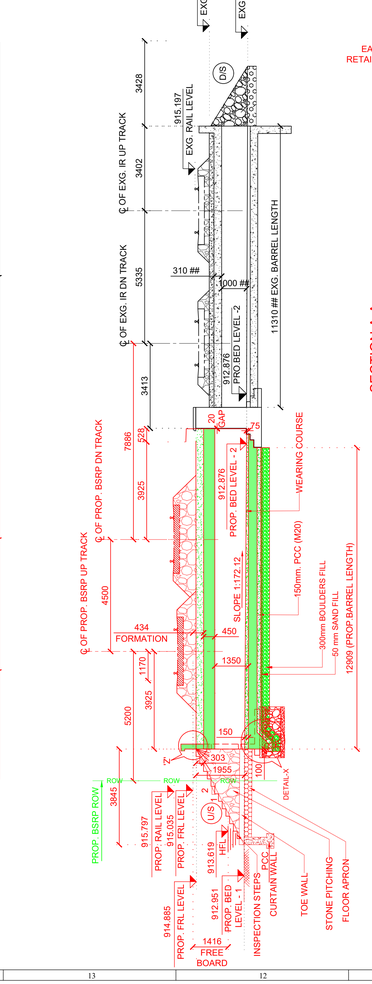
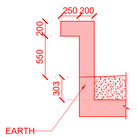




HFL	FREE BOARD (mm)	BED LEVEL-1	BED LEVEL-2
913.619	1416	912.951	912.876

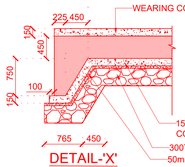




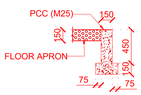


DETAIL-'Z'
(SCALE 1:75)

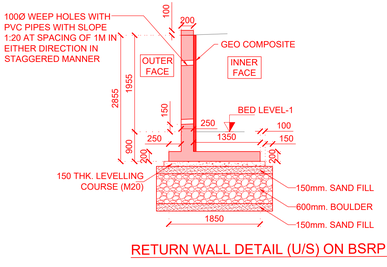
SECTION A-A



DETAIL-'X'
(SCALE 1:50)



PCC CURTAIN WALL DETAILS ON IR SIDE
(SCALE 1:75)



RETURN WALL DETAIL (U/S) ON BSRP SIDE

WATERWAY PARTICULARS

CATCHMENT AREA	:	0.022 SQKM.
LATITUDE	:	13° 2' 51.027" N
LONGITUDE	:	77° 32' 14.768" E
TOPOSHEET NO	:	D43 R-12
Q50 DISCHARGE	:	0.74 CUM/SEC
VELOCITY	:	1.5 M/S
DEPTH OF FLOW	:	0.740 M
OHFL	:	913.619 M
Q50HFL (DESIGN HFL)	:	913.619 M

	REQUIRED	PROVIDED
WATERWAY AREA, Sqm	2.38	3.84
FREE BOARD, m	1.000	1.416
VERTICAL CLEARANCE, m	0.000	0.496
SCOUR DEPTH	0.435	
From Qf HFL, m	913.184	
Scour Level		
From B.L, m	0	1.2

EXISTING WATERWAY PARTICULARS

	PROVIDED
WATERWAY AREA, Sqm	2.88
FREE BOARD, m	0.974
VERTICAL CLEARANCE, m	0.457

BASE PRESSURE AT FOUNDATION LEVEL

STRUCTURE	MAX	MIN
RCC BOX (kN/m^2)	180.0	——
RETURN WALL (kN/m^2)	109.580	——

BRIDGE DETAILS

DESCRIPTION	EXISTING IR BRIDGE : 409	PROPOSED BSRP BRIDGE : 409
CHAINAGE AT CENTER OF BRIDGE (km)	08+648.878	19+655.295
RAIL LEVEL AT CENTER OF BRIDGE (m)	915.197	915.797
FORMATION LEVEL AT CENTRE OF BRIDGE (m)	914.577	915.035
DIMENSIONS (NOS x SPAN(m) x HEIGHT(m))	2 x 1.2 x 1.00	1 x 3.2 x 1.35
STRUCTURE CONFIGURATION	RCC SLAB	RCC BOX

DEPTH OF CONSTRUCTION FOR 1 x 3.2 x 1.35 m RCC BOX

RAIL 60 kg	:	172 mm
GR PAD	:	10 mm
PSC SLEEPER	:	230 mm
BALLAST CUSHION	:	350 mm
EARTH CUSHION	:	434mm
TOP SLAB	:	450 mm
TOTAL	=	1646mm

TRACK DETAILS (PROP.BRIDGE)

LOADING	:	25 T-AXLE LOAD 2008-STD
ALIGNMENT	:	STRAIGHT
GRADE	:	FALL 1 IN 298.507
RAIL LEVEL	:	915.797 m
FORMATION LEVEL	:	915.035 m

TRACK DETAILS (EXG.BRIDGE)

LOADING	:	MBG-1987
ALIGNMENT	:	STRAIGHT
GRADE	:	STRAIGHT
RAIL LEVEL	:	915.197 m
FORMATION LEVEL	:	914.577 m

GRADE OF CONCRETE

	GRADE	
i.	RCC BOX	M35
ii.	WEARING COURSE	M25
iii.	LEVELLING COURSE (PCC)	M20
iv.	RETAINING/RETURN WALL	M35

* THE GAP TO BE FILLED WITH SUITABLE SEALANT MATERIAL

ABBREVIATIONS :

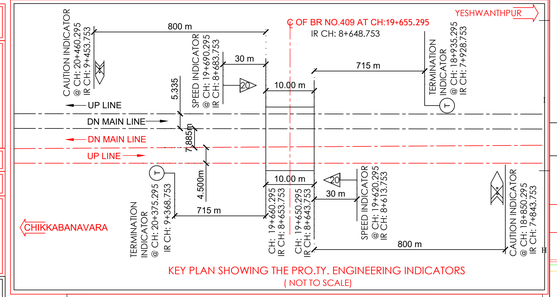
℄	-	CENTER LINE
TYP	-	TYPICAL
THK.	-	THICKNESS
U/S	-	UP STREAM SIDE
D/S	-	DOWN STREAM SIDE
DN	-	DOWN
BR	-	BRIDGE
FRL	-	FORMATION LEVEL
PROP.	-	PROPOSED
EXG.	-	EXISTING

NOTE :
1.RETRO REFLECTIVE TYPE OF INDICATORS SHALL BE USED
2.SUITABLE CAUTION ORDER WILL BE IMPOSED BASED ON SITE REQUIREMENT.

DETAILS OF EXISTING STRUCTURE SHOWN ARE AS PER JSVR / COMPLETION PLAN

STRATA DESCRIPTION	DEPTH IN METERS	REMARKS: BLOW COUNTS (N-VALUE)	REMARKS: SBC (kN/SQM)
BORE LOG TOP	0.00		
GROUND LEVEL : 914.152	0.50		
	1.00	N = 7 (3/3/4)	
BED LEVEL (912.951) & (912.876)	1.50		
	2.00		131.11 (BOX)
PROPOSED BOX FOUNDING LEVEL (912.351)	2.50		119.63 (RW)
	3.00	N = 21 (8/10/11)	
RETURN WALL FOUNDATION LEVEL (912.051)	3.50		
	4.00		
MEDIUM STIFF TO HARD CLAY OF MEDIUM PLASTICITY	4.50	N = 32 (6/12/20)	
	5.00		
	5.50		
	6.00	N = 19 (6/10/09)	
	6.50		
	7.00		
	7.50	N = 33 (7/16/17)	
	8.00		
	8.50	N = 27 (7/12/15)	
END OF BOREHOLE AT 9.00 m	9.00		

BOREHOLE-228



KEY PLAN SHOWING THE PRO.TY, ENGINEERING INDICATORS
(NOT TO SCALE)

SPECIFICATION:

1. ALL WORKS ARE TO BE CARRIED OUT AS PER THE FOLLOWING.
   a. INDIAN RAILWAY UNIFIED STANDARD SPECIFICATIONS FOR WORKS AND MATERIALS 2019.
   b. IRS CONCRETE BRIDGE CODE 2014 (REPRINT) & RELEVANT I.S SPECIFICATIONS.
   c. IRS BRIDGE SUB - STRUCTURE CODE,2013 (ii REVISED).
   d. IRS BRIDGE RULES 2014 (REPRINT).
2. WING WALL/RETURN WALL : REINFORCED CEMENT CONCRETE OF GRADE M35 WITH DESIGN MIX.
3. PITCHING : DRY STONE PITCHING 230MM THICK OVER 150MM THICK SAND MIXED WITH STONE CHIPS (AS PER PARA 205 OF INDIAN RAILWAY BRIDGE MANUAL ANNEXURE 2/3).
4. RCC BOX : REINFORCED CEMENT CONCRETE M35 GRADE USING 20MM MAXIMUM SIZE GRADED HARD STONE AGGREGATE OF APPROVED QUALITY.
5. LEVELING COURSE : 150 MM THICK M20 DESIGN MIX.
6. WEEP HOLES : WEEP HOLES TO BE PROVIDED AS PARA 7.6 OF SUB STRUCTURE CODE & WEEP HOLES SHALL BE OF 100 DIA AC PIPES STAGGERED AT 1000 C/C ABOVE LOW WATER LEVEL IN BOTH WING WALL/RETURN WALL & EARTH RETAINER OF BOX.
7. LOADING STANDARD : 25 T - 2008 AXLE LOAD.
8. TOE WALL : GRADE M25 WITH DESIGN MIX.
9. GRADE OF STEEL FOR RCC IS TMT-500D CONFORMING TO IS 1786-2008.
10. MASS CONCRETE TO BE OF M25 WITH 20MM GRADED STONE AGGREGATE FOR WEARING COURSE.
11. CONCRETE SHALL BE MECHANICALLY MIXED,VIBRATED & THOROUGHLY CURED.
12. BAR BENDING SHALL CONFORM TO IS 2502.
13. FLOORING : ROUGH STONE FLOORING 300MM THICK GROUTED WITH CM:1:3.
14. DROP WALL / CURTAIN WALL : GRADE M25 WITH DESIGN MIX.
15. WHEREVER SBC IS LESS THAN THE REQUIREMENT AS PER RDSO DRAWING,IMPROVE THE SBC OF SOIL TWO LAYERS OF 150MM SAND & BOULDER FILLING OF 600MM THICKNESS EACH TO BE LAID & COMPACTED BEFORE LEVELING COURSE FOR RCC BOX, RETURN WALL FOUNDATION & APRON FLOORING
16. COPING : CC M25 GRAD USING 20MM MAX.SIZE GRADED HARD STONE AGGREGATE OD APP.QUALITY.
17. SKIN REINFORCEMENT TO BE PROVIDED FOR WING & RETURN WALL AS PER DESIGN.
18. GROUND IMPROVED SOIL SHALL BE OF SOIL QUALITY CLASS SQ2 AND SQ3 AS PER RDSO GUIDELINES.
19. FOR RETURN STRUCTURE, SEPERATE DRAWING WILL BE SUBMITTED.
20. TYPICAL COLLAR SHALL BE PROVIDED BETWEEN THE EXISTING AND PROPOSED STRUCTURE AS PER LETTER BEARING NO.SWR/W.70/POLICY/2022 DATED ON 08.09.2022 ISSUED BY SWR.
21. THE DIMENSION OF RETURN WALL SHOWN IN GAD ARE ONLY INDICATIVE AND TO FOLLOW AS PER APPROVAL DESIGN AND DRAWING.

REFERENCE:

1. RCC BOX (CAST -IN-SITU) - DRG NO:RDSO/B-10155 & RDSO/B-10155/2
2. SUBSTRUCTURE BOX - O22077-BSRP-CR2-C-NB-0-30-1196
3. RETURN WALL - O22077-BSRP-CR2-C-NB-0-30-1197
4. WEEP HOLES AS PER PARA 7.6 OF SUB-STRUCTURE CODE
5. CURTAIN WALL AND TOE WALL AS PER DESIGN
6. BACKFILL MATERIALS BEHIND RCC BOX TO PROVIDE AS PER PARA 7.5 OF IRS BRIDGE SUBSTRUCTURE &FOUNDATION CODE
7. SHORING ARRANGEMENTS AS PER DESIGN.
8. GIR DOCUMENT NO.
   FOR BOX : DOC-BSRP-CR2-AG-DGN-GB-20-1159
   FOR RETURN WALL : DOC-BSRP-CR2-AG-DGN-GBRW-20-1159
9. DESIGN OF TYPICAL EARTH RETAINER / PARAPET WALL (UPTO 2m HEIGHT)
   DOC NO : DOC-BSRP-CR2-AG-DGN-GEN-20-2000
   DWG NO.O22077-BSRP-CR2-C-GEN-20-2000

BRIDGE STRENGTH CERTIFICATE

CERTIFIED THAT THE PRO RCC BOX BRIDGE, BR. NO. 409 OF 1X3.20X1.35m AT BSRP CH: 19+655.295, IR KM 8+648.873 TO BE CONSTRUCTED IS OF SUCH DESIGN, DIMENSIONS AND CONSTRUCTIONS AS WILL ENABLE IT TO CARRY THE DEAD LOAD OF THE STRUCTURE ITSELF (INCLUDING P-WAY COMPLETE) AND IN ADDITION TO THE EQUIVALENT OF 25T - 2008 LOADING PRESCRIBED IN THE BRIDGE RULES CHAPTER VII OF THE RULES FOR THE OPENING OF RAILWAYS AT FULL SPEED.
ALSO CERTIFIED THAT THE HEAVIEST LOADS WHICH THE BRIDGE WILL HAVE TO CARRY WILL NOT BE IN EXCESS OF THE ABOVE STANDARDS OF LOADING AT THE STIPULATED SPEED AND WILL NOT CAUSE ANY STRESS IN ANY MEMBERS OR PORTION OF THE STRUCTURE IN EXCESS OF MAXIMUM PERMISSIBLE STRESSES LAID DOWN IN THE INDIAN RAILWAY STANDARD CODE OF PRACTICES.

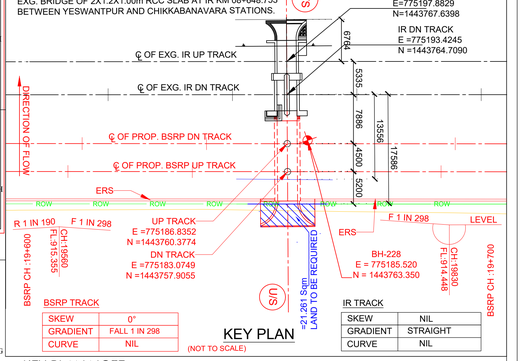
L&T | GC | KRIDE

MODUS OPERANDI :

1. IMPOSE 20KMPH SPEED RESTRICTIONS DURING EXCAVATION WORKS,IF REQUIRED AS PER SITE CONDITION.
2. DIVERT OR RESTRICT THE WATER FLOW BY PROVIDING BUND/TEMPORARY PIPES ON UPSTREAM SIDE OF THE BRIDGE.
3. PORTION OF RETURN WALL/TOE WALL_PITCHING TO BE DISMANTLED TO ACCOMMODATE RCC BOX WITH SUITABLE SHORING CONDITION AS PER SITE CONDITION .
4. EARTH WORK EXCAVATION TO BE DONE FOR PROPOSED BARREL LENGTH WITH 350MM BASE COURSE FILL BENEATH THE BOX BOTTOM RAFT.
5. RETURNS & BRIDGE PROTECTION WORKS TO BE DONE ON IR SIDE.

LEGENDS:

Total Barrel length of MIB 409 = 12.909m.
Completed Barrel length = 12.909m(BSRP SIde).
Remaining Barrel length 0m



KEY PLAN NOTE:-

1. PROPOSALS ARE SHOWN IN RED.
2. RAILWAY BOUNDARY DISTANCE ARE WITH RESPECT TO CENTRE LINE OF EXG.TRACK.
3. TRACK IS STRAIGHT ON BRIDGE LOCATION.

NOTES:

1. ALL LEVELS ARE W.R.T TO MSL.
2. ALL DIMENSIONS ARE IN MILLIMETERS, REDUCED LEVELS ARE IN METRES AND CHAINAGE ARE IN KILOMETERS, UNLESS STATED OTHERWISE.
3. DO NOT SCALE THE DRAWING,FOLLOW FIGURED DIMENSIONS ONLY.
4. THE TYPE,DESIGN & DEPTH OF FOUNDATION SHOWN IN GAD ARE INDICATIVE ONLY. THE ACTUAL TYPE & DEPTH OF FOUNDATION WILL BE DECIDED BY THE ENGINEER-IN-CHARGE AS PER ACTUAL SOIL ENCOUNTERED AT SITE DURING EXECUTION.
5. SAFE BEARING CAPACITY OF SOIL OF BELOW SOIL IMPROVEMENT 131.11 KN/SQM.
6. LENGTH OF PITCHING FOR APPROACHES SHALL BE DECIDED BY THE ENGINEER-IN-CHARGE OF THE WORK TO SUIT SITE CONDITIONS.
7. FOR DETAILS OF OLD BRIDGE (EXG.) AS PER THE SITE DETAILS PROVIDED.
8. DISMANTLING OF EXISTING BRIDGE AND PROTECTIVE /PITCHING SHOULD BE DONE AS PER SITE CONDITION.
9. A) ON THE TOP SURFACE OF CONCRETE AT THE END OF EACH DAYS WORK DEPRESSION IN ZIG-ZAG PATTERN TO BE FORMED BY EMBEDDING WOODEN SCANTLINGS OR SLEEPERS TO FORM KEY FOR ADEQUATE BOND FOR THE NEXT DAYS CONCRETING.
   B) ON THE NEXT WORKING DAY ALL THE LAITANCE SHALL BE REMOVED BY SCRUBBING THE SURFACE WITH WIRE BRUSH WITHOUT DISLODGING THE PARTICLES OF AGGREGATE,THE SURFACE SHALL BE THOROUGHLY WETTED & CAN BE COATED WITH NEAT CEMENT GROUT BEFORE FIRST LAYER OF CONCRETE IS LAID.
10. THE BOULDER FILLING SHALL CONSISTS OF WELL HAND PACKED BOULDERS & COBBLES TO THICKNESS NOT LESS THAN 600 mm BEHIND THE BOULDER FILLING. BACKFILLING MATERIALS SHALL CONSIST OF GRANULAR MATERIALS OF GW, GP, SW CORRECT AS PER IS 1498 - 1970.
11. EXPOSURE CONDITION IS MODERATE.
12. CONTROLLED CONCRETE AS PER DESIGN MIX TO BE USED AND MIXED BY WEIGH BATCHING.
13. DISMANTLING ELEMENTS ARE SHOWN IN DOTTED LINE.
14. WHILE EXECUTION OF PRO. BRIDGE FOR STAGE-1, EXISTING FLOOR PROTECTIVE WORKS MAY GET DAMAGED, PROTECT THE EXG.BRIDGE FROM SCOURING EFFECT FLOORING PROTECTIVE WORKS WILL BE PROVIDED.
15. SUITABLE SPEED RESTRICTIONS MAY BE IMPOSED BASED ON SITE CONDITIONS WHENEVER & WHEREVER IF IS NEEDED TO ENSURE SAFETY OF RUNNING LINE.
16. SUITABLE PROTECTIVE MEASURES SHOULD BE PUT IN PLACE WHILE CARRYING OUT THE WORK IN CONSULTATION WITH KRIDE & GENERAL CONSULTANT.THIS SHALL INCLUDE NECESSARY SHORING ARRANGEMENTS TO BE PROVIDED FOR THE PROTECTION OF EXG.TRACK & FORMATION.
17. INSTRUCTIONS CONVEYED VIDE PCE'S CIRCULAR NO 01.2015, DATED: 09.03.2015 REGARDING" WORK DISIPLINE AT SITE" AND AS PER PCE CIRCULAR NO.01/2021 DATED: 22.06.2021 REGARDING "ENSURING QUALITY OF WORK AND MAINTAINING SITE RECORDS IN WORKS CONTRACTS" TO BE STRICTLY FOLLOWED.
18. IT IS TO ENSURED BY KRIDE/BSRP-CORz GM/CIVIL/PROJECTS BEFORE EXECUTION, THAT THE MAXIMUM BASE PRESSURE AT THE FOUNDATION LEVEL FOR EACH ELEMENT OF BRIDGE IS LESS THAN THE SAFE BEARING CAPACITY OF THE SOIL AT THAT LOCATION.
19. 20MM THK THERMOCOL SHEETS TO BE PROVIDED BETWEEN FACE WALL OF EXG.BRIDGE & PRO.RCC BOX & IF REQUIRED DOWEL BARS TO BE FIXED.
20. ENGINEER IN-CHARGE SHALL ENSURE THAT LEVEL OF FOUNDATION OF DROP WALL, CURTAIN WALL AND RETURN WALL SHALL BE SUFFICIENTLY LOWER LEVEL THAN THE REQUIRED CALCULATED SCOUR LEVEL.
21. FEASIBILITY OF THIS BOX STRUCTURE AT SITE SHOULD BE ENSURED BY GM/KRIDE/BSRP-CORRIDOR2
22. THIS DRAWING IS PREPARED BASED ON RDSO STANDARD DRG NO:- RDSO/B/10155 & 10155/2, AS PER SIZE 1x4.0x2.0m WITH & 1m FILL HEIGHT.

LOADING STANDARD
A) PRO BRIDGE:25T-AXLE LOAD 2008 STD
B) EXG.BRIDGE:MBG OF 1987

GENERAL CONSULTANTS:
EGIS-AECOM-WSP

EMPLOYER :
RAIL INFRASTRUCTURE DEVELOPMENT COMPANY (KARNATAKA) LIMITED

GENERAL ARRANGEMENT DRAWING

BENGALURU SUBURBAN RAILWAY PROJECT(BSRP)
BETWEEN STATIONS BENNIGANAHALLI AND CHIKKABANAVARA

DRAWING TITLE : MINOR BRIDGE NO.409 AT BSRP CH:19+655.295
PRO.CONSTRUCTION OF 1X3.20X1.35 (1.20 CLEAR HEIGHT)m RCC BOX(CAST-IN-SITU) ON UP STREAM SIDE OF THE
EXG, BRIDGE OF 2X1.20X1.00m RCC SLAB AT IR KM 8+648.753 BETWEEN YESWANTPUR AND CHIKKABANAVARA STATIONS.

GC/K-RIDE	K-RIDE
FOR GC	FOR K-RIDE

KRIDE.DRG.NO:
HQ.DRG.NO:

SCALE : 1:100 (UNLESS SPECIFIED OTHERWISE)	DRAWING NO : O22077-BSRP-CR2-C-NB-0-30-1195	REVISION 1	DWG STATUS C

PRELIMINARY DWG (P), DEFINITIVE DWG (D), CONSTRUCTION DWG (C), AS BUILT DWG (B), SHOP DWG (S), MANUFACTURED DWG (M) — SHEET SIZE - A1