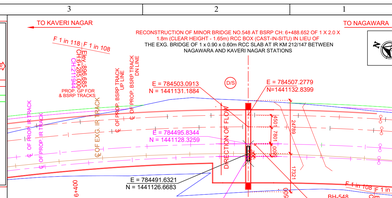
KEY PLAN

SCALE 1:1000



LEGENDS:

- = COLOUR CODE BLACK = EXG. WORKS
- = COLOUR CODE RED = PROP. R.U.Y WORKS
- = COLOUR CODE YELLOW = TO BE DISMANTLED
- = COLOUR CODE MAGENTA = PROP. IR TRACK

ABBREVIATIONS

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

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 IS 13.51 KN/M².
6. LIVE LOAD CONSIDERED FOR THE 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 WASHED AND IS 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, BACKING 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. ALL CONCRETE SHALL BE CURED FOR 14 DAYS.
14. WHILE EXECUTION OF PROP. BRIDGE FOR STAGE-1 EXISTING IR TRACK SHOULD 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 DTD. 03.03.2015 REGARDING WORK EXECUTION BY CONTRACTOR AND SUPERVISION BY CONSULTANT/RAILWAY/KRIDE/DURING QUALITY OF WORK AND MAINTAINING SITE RECORDS IN WORKS CONTRACTS" TO BE STRICTLY FOLLOWED.
18. 20MM THK THERMOCOL SHEETS TO BE PROVIDED BETWEEN FACE WALL OF EXG.BRIDGE & PROP.RCC BOX & IF REQUIRED DOWEL BARS TO BE FIXED.
19. 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.
20. THIS DRAWING IS PREPARED BASED ON RDSO STANDARD DRG NO: RDSO/B-10155 & 10155/S AS PER BOX SIZE: 1x2.0x1.8m

REFERENCE:

1. RCC BOX (CAST-IN-SITU) - DRG NO. RDSO/B-10155 & 10155/S
2. RETURN WALL DESIGN DOCUMENT NO.DOC-BSRP-CR2-AG-DGN-RW-30-1119
3. RETAINING WALL - DOC0077-BSRP-CR2-CJMB-0-30-1160
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. LIVE LOAD CONSIDERED
   FOR BOX: DOC-BSRP-CR2-AG-DGN-GB-20-1119
   FOR RETURN WALL : DOC-BSRP-CR2-AG-DGN-GBRW-20-1119
9. DESIGN OF TYPICAL EARTH RETAINER / PARAPET WALL (UPTO 2m HEIGHT) DOC-BSRP-CR2-AG-DGN-GEN-20-2000
   DWG NO.C02077-BSRP-CR2-C-GEN-20-2000

BRIDGE STRENGTH CERTIFICATE

CERTIFIED THAT THE PRO RCC BOX BRIDGE,BR.NO.548 OF 1x2.0x1.8m AT BSRP CH:-6+488.652, IR KM 212/147 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 20KM/H 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.

LOADING STANDARD

A) PROP.BRIDGE:25T-AXLE LOAD 2008 STD

B) EXG.BRIDGE:MBG OF 1987

LEGENDS:

Total Barrel length of MIB 548 = 32.930m.

Completed Barrel length = 13.850m(BSRP Side)

Remaining Barrel length 19.080m is yet to be Constructed.

DEPTH OF CONSTRUCTION FOR 1 x 2 x 1.8 m RCC BOX

RAIL 60 kg	:	172 mm
GR PAD	:	10 mm
PSC SLEEPER	:	230 mm
BALLAST CUSHION	:	350 mm
EARTH CUSHION	:	3312 mm
TOP SLAB	:	350 mm
TOTAL	:	4424 mm

BRIDGE DETAILS

DESCRIPTION	EXG. IR BRIDGE - 548	PROP. BSRP BRIDGE - 548
CHAINAGE AT CENTER OF BRIDGE (km)	212/147	6+488.652
RAIL LEVEL AT CENTER OF BRIDGE (m)	891.378	895.581
FORMATION LEVEL AT CENTRE OF BRIDGE (m)	890.853	894.819
DIMENSIONS (Nos x SPAN(m) x HEIGHT(m))	1 x 0.9 x 0.60##	1 x 2 x 1.8m
STRUCTURE CONFIGURATION	SLAB BRIDGE	RCC BOX

DETAILS OF EXG. CURVE SHOWN ARE AS PER JSVR

* THE GAP TO BE FILLED WITH SUITABLE SEALANT MATERIAL

BASE PRESSURE AT FOUNDATION LEVEL

STRUCTURE	MAX	MIN
RCC BOX (KN/m²)	210.0	-
RETURN WALL - (U/S) (KN/m²)	98.198	-
RETURN WALL - (D/S) (KN/m²)	208.36	-

WATERWAY PARTICULARS

CATCHMENT AREA	:	0.141 SQKM
LATITUDE	:	13°1'22.371"N
LONGITUDE	:	77°37'22.213" E
TOPOSHEET NO	:	OA18-I5-12
QIS DISCHARGE	:	3.78 CUMSEC
VELOCITY	:	1.9 M/S
DEPTH OF FLOW	:	0.41 M
GHFL	:	889.857 M
DSHFL (DESIGN HFL)	:	889.857 M

	REQUIRED	PROVIDED
WATERWAY AREA, Sqm	0.82	2.70
FREE BOARD, m	1.00	4.769
VERTICAL CLEARANCE, m	0.00	1.000
SCOUR DEPTH		
From GF HFL, m	-	1.533
Scour Level	-	889.324
From B.L, m	0	1.2

EXG. WATERWAY PARTICULARS

	PROVIDED
WATERWAY AREA, Sqm	0.541
FREE BOARD, m	0.996
VERTICAL CLEARANCE, m	0.300

TRACK DETAILS (EXG.BRIDGE)

LOADING	:	MBG-1987
ALIGNMENT	:	STRAIGHT
GRADE	:	F1 IN 108
RAIL LEVEL	:	891.378 m
FORMATION LEVEL	:	890.853 m

STRATA DESCRIPTION	DEPTH IN METERS	REMARKS BLOW COUNTS (N-VALUE)	SBC (kN/SQM)
LOOSE CLAYEY SAND (SC)	0.00 – 3.50	N =8 (3/3/5)	131.51 (BOX) 900 (RW-U/S) 400 (RW-D/S)
STIFF CLAY OF LOW PLASTICITY (CL)	3.50 – 5.00	N =11 (2/5/6)	
	5.00 – 6.50	N =9 (4/4/5)	
LOOSE TO VERY DENSE SILTY SAND (SM)	6.50 – 9.00	N =17 (5/8/9)	
	9.00 – 10.00	N =21 (6/8/13)	
END OF BOREHOLE AT 10.00m	10.00 – 11.00	N =45 (14/20/25)	
	11.00 – 12.00	N =53 (17/24/29)	

GROUND LEVEL: 891.169

BED LEVEL: 889.507/889.432

PROP. FOUNDATION LEVEL: 889.907

RETAINING FOUNDATION LEVEL: 887.757/887.682

BOREHOLE ID-548 (BH-19B)

TRACK DETAILS (PROP.BRIDGE)

LOADING	:	25 T AXLE LOAD 2008-STD
ALIGNMENT	:	CURVE
GRADE	:	F1 IN 108
RAIL LEVEL	:	895.581 m
FORMATION LEVEL	:	894.819 m

GRADE OF CONCRETE

1	RCC BOX	M30
2	WEARING COURSE	M25
3	LEVELLING COURSE (PCC)	M20
4	RETAINING/RETURN WALL	M35

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(0) REVISED).
2. CEMENT CONCRETE M35 GRADE.
3. RETURN WALL/RETAINING WALL - REINFORCED CEMENT CONCRETE OF GRADE M35 WITH DESIGN MIX.
4. 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).
5. RCC BOX:- REINFORCED CEMENT CONCRETE M35 GRADE USING 20MM MAXIMUM SIZE GRADED HARD STONE AGGREGATE OF APPROVED QUALITY.
6. LEVELING COURSE :- 150 MM THICK M20 DESIGN MIX.
7. 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 CC ABOVE LOW WATER LEVEL AND SHALL BE PROVIDED WITH FILTER MEDIA BEHIND THE EARTH RETAINER OF BOX.
8. LOADING STANDARD :- 25 T - 2008 AXLE LOAD.
9. TOE WALL :- GRADE M25 WITH DESIGN MIX.
10. GRADE OF STEEL FOR RCC IS FE TMT-500D CONFORMING TO IS 1786-2008.
11. MASS CONCRETE TO BE OF M25 WITH 20MM GRADED STONE AGGREGATE FOR WEARING COURSE.
12. CONCRETE SHALL BE MECHANICALLY MIXED,VIBRATED & THOROUGHLY CURED.
13. BAR BENDING SHALL CONFORM TO IS 2502.
14. DRY RUBBLE PITCHING SHALL BE 230MM THICK GROUTED WITH CM:1:3.
15. DROP WALL / CURTAIN WALL :- GRADE M35 WITH DESIGN MIX.
16. WHEREVER SBC IS LESS THAN THE REQUIRMENT AS PER RDSO DRAWING, IMPROVE THE SBC OF SOIL TWO LAYERS OF 150MM SAND & BOULDER FILLING OF 450MM THICKNESS EACH TO BE LAID & COMPACTED BEFORE LEVELING COURSE FOR RCC BOX, RETURN WALL FOUNDATION & APRON FLOORING.
16. COPING :- CC M25 GRAD.10MM MAX SIZE GRADED HARD STONE AGGREGATE OD APP.QUALITY.
17. GROUND IMPROVED SOIL SHALL BE OF SOIL QUALITY CLASS SG2 AND SG3 AS PER RDSO GUIDELINES.
18. FOR RETAINING STRUCTURE, SEPERATE DRAWING WILL BE SUBMITTED.
19. THE DIMENSION OF INTEGRATED RETURN WALL & SACRIFICIAL RETURN WALL SHOWN IN GAD ARE ONLY INDICATIVE AND TO FOLLOW AS PER APPROVAL DESIGN AND DRAWING.

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

RECONSTRUCTION OF MINOR BRIDGE NO.548 AT BSRP CH: 6+488.652 OF 1 X 2.0 X 1.8m (CLEAR HEIGHT - 1.65m) RCC BOX (CAST-IN-SITU) IN LIEU OF THE EXG. BRIDGE OF 1 X 0.90 x 0.60m RCC SLAB AT IR KM 212/147 BETWEEN NAGAWARA AND KAVERI NAGAR STATIONS

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

KRIDE.DRG.NO:

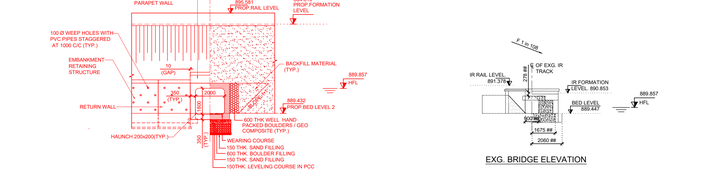
HQ.DRG.NO:

SCALE : (UNLESS SPECIFIED OTHERWISE)

DRAWING NO. : O22077-BSRP-CR2-C-NB-0-30-1058

REVISION	DWG STATUS
1	C

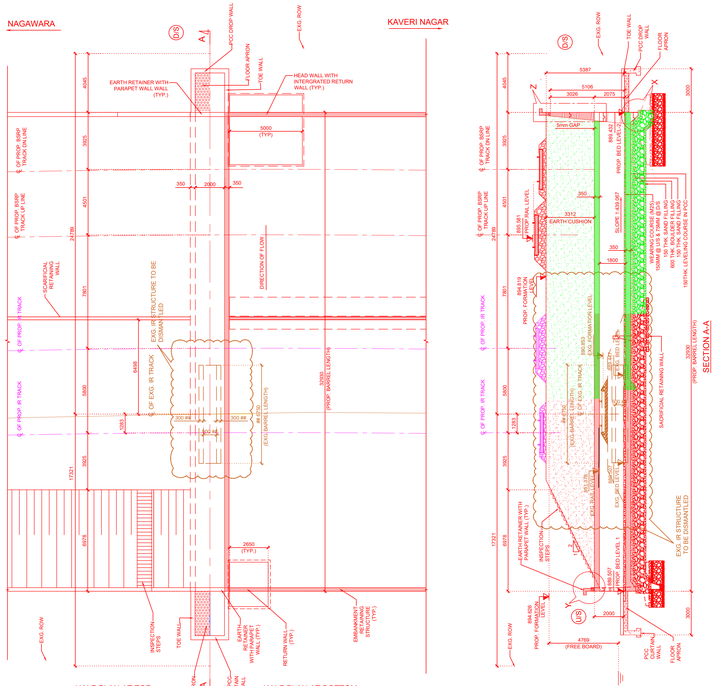
PRELIMINARY DWG (P), DEFINITIVE DWG (D), CONSTRUCTION DWG (C), AS BUILT DWG (B), SHOP DWG (S), MANUFACTURED DWG (M). SHEET SIZE - A1



HALF ELEVATION

EXG. BRIDGE ELEVATION

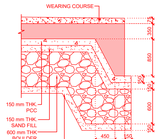
HALF SECTION



HALF PLAN AT TOP

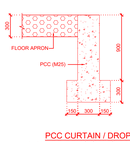
HALF PLAN AT BOTTOM

HFL	FREE BOARD (mm)	BED LEVEL-1	BED LEVEL-2
889.857	4769	889.507	889.432



DETAIL-X

(SCALE 1:30)



PCC CURTAIN / DROP WALL DETAILS ON BSRP SIDE

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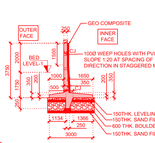
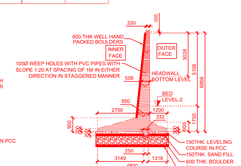


RCC RETURN WALL SECTION (U/S) ON IR SIDE

(SCALE 1:150)



RCC RETURN WALL SECTION (D/S) ON BSRP SIDE

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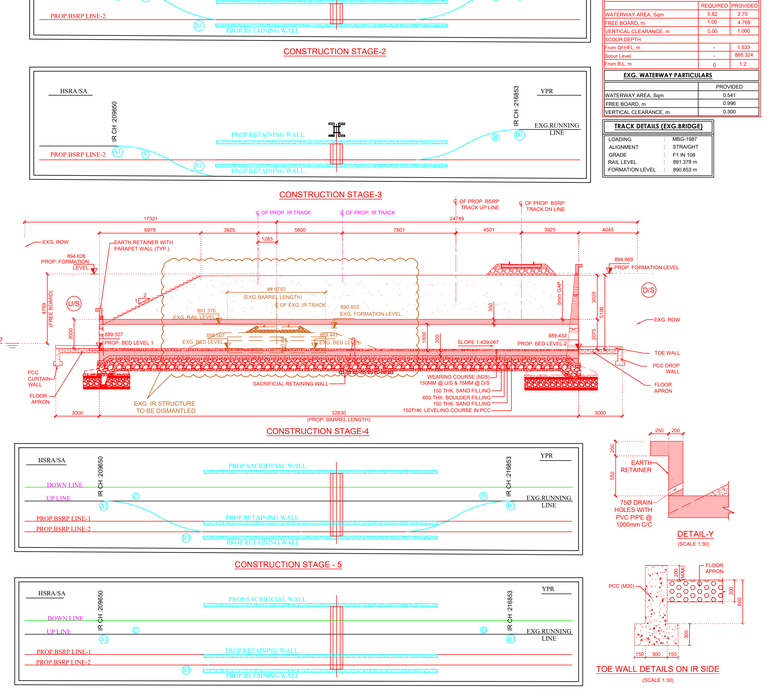
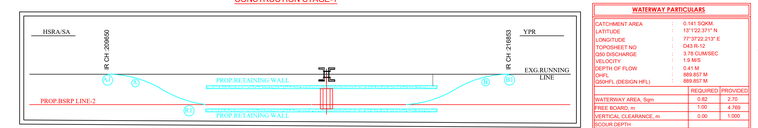


CONSTRUCTION STAGE-1



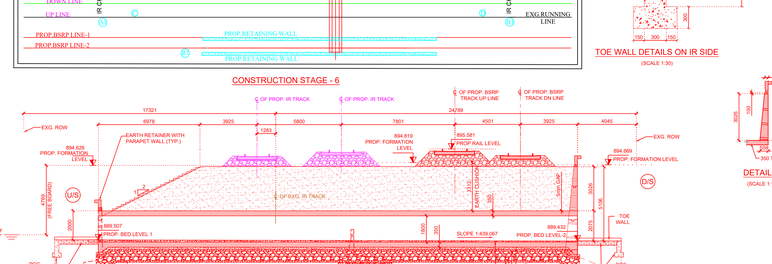
CONSTRUCTION STAGE-2

CONSTRUCTION STAGE-3

CONSTRUCTION STAGE-4

CONSTRUCTION STAGE - 5

CONSTRUCTION STAGE - 6



CONSTRUCTION STAGE - 7

DETAIL-Y

(SCALE 1:30)

TOE WALL DETAILS ON IR SIDE

(SCALE 1:30)

DETAIL -'Z'

(SCALE 1:150)