

DESIGN CRITERIA

1.0 DESIGN STANDARDS

1.1 STRUCTURES HAVE BEEN DESIGNED IN ACCORDANCE WITH THE LATEST VERSION OF THE FOLLOWING STANDARDS:

CAV/CSA-086.1 ENGINEERING DESIGN IN WOOD (LIMIT STATES DESIGN)

CAV/CSA-S16.1 LIMIT STATES DESIGN OF STEEL STRUCTURES

CAV/CSA-A23.3 DESIGN OF CONCRETE STRUCTURES

2.0 TIDE ELEVATIONS

2.1 ALL ELEVATIONS AND DEPTHS ARE IN METRES AND DECIMALS THEREOF TO GEOMETRIC DATUM.

2.2 SOUNDING SURVEYS COMPLETED BY WESTMAR ON AUGUST 30, 2001, AND SEPTEMBER 9, 2001, USING A TRIMBLE PATHFINDER PRO AND A TRIMBLE SCOUT 2000. THE SOUNDING INFORMATION ON THIS PLAN REPRESENTS THE RESULTS OF SURVEYS MADE ON THE DATES INDICATED AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITION EXISTING AT THAT TIME.

2.3 ELEVATIONS ARE TO CITY OF NORTH VANCOUVER GEOMETRIC DATUM. BENCH MARK USED: CONTROL MONUMENT 73H1028 LOCATED AT THE INTERSECTION OF ST. GEORGES AVENUE AND EAST 1ST STREET ELEVATION 19.339 METRES.

2.4 TIDE LEVELS ARE AS FOLLOWS:

(H.A.W.L.)	2.00 METRES
MEAN WATER LEVEL	0.00 METRES
LOW WATER LEVEL	-1.10 METRES
(L.L.W.L.)	-3.1 METRES

3.0 FILL AND SLOPE PROTECTION

3.1 MAXIMUM WAVE HEIGHT:  $H_s = 1.25m$

3.2 PEAK WAVE PERIOD:  $T_p = 3.5$  SECONDS

3.3 GEOTECHNICAL:

FILL IS DESIGNED FOR STATIC STABILITY. IN-SITU SOILS ON WHICH FILL IS PLACED MAY HAVE A POTENTIAL FOR LIQUEFACTION UNDER SEISMIC EVENTS.

4.0 FLOAT AND GUNWAY AT PIER 'K'

4.1 DEAD LOAD SHALL INCLUDE THE WEIGHT OF ALL STRUCTURAL FRAMING AND OTHER COMPONENTS FIXED TO AND PERMANENTLY INTEGRATED INTO THE STRUCTURE.

4.2 SNOW LOADS SHALL BE IN ACCORDANCE WITH THE B.C. BUILDING CODE. (SNOW LOAD BASED ON BSBC FOR NORTH VANCOUVER)

4.3 WIND SPEEDS:

1:30 YEAR RETURN PERIOD HOURLY WIND SPEED (BASED ON DATA FOR VANCOUVER, B.C.) 108  $kph$

4.4 FLOAT TO BE DESIGNED TO WITHSTAND LOADS FROM WAVES WITH MAXIMUM HEIGHT:

Wave height = 2.25 METRES

Wave period = 3.5 SECONDS

4.5 DESIGN VESSEL:

LOADS ON FLOATS TO BE ASSESSED ON THE BASIS OF THE PRIDE OF VANCOUVER HARBOUR CRUISE VESSEL AND THE FAIR JEANNE SAIL BOAT VESSEL.

4.6 BERTHING CRITERIA:

-MAXIMUM BERTHING VELOCITY PERPENDICULAR TO BERTH FACE = 0.5m/s

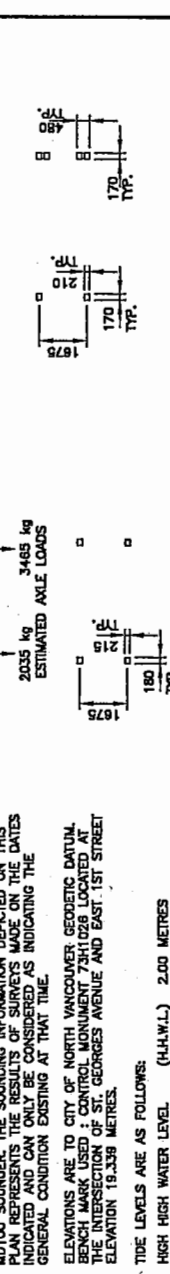
-MAXIMUM ANGLE OF APPROACH = 10 DEGREES

-QUARTER POINT BERTHING

5.0 PIER 'B' PRECAST CONCRETE SLAB LOADS

5.1 THE PRECAST CONCRETE SLABS ARE DESIGNED FOR THE FOLLOWING LOADS:

- UNIFORMLY DISTRIBUTED DEAD LOAD FROM OVERLYING DECK FINISH 3.0  $kPa$
- UNIFORMLY DISTRIBUTED LIVE LOAD: 4.8  $kPa$
- STANDARD 6,000 kg (6.0M) AMBULANCE AS USED BY BC AMBULANCE. SHOWN BELOW. INCREASE 25 PERCENT FOR DYNAMIC ALLOWANCE.



GENERAL

1.1 DETAILED REQUIREMENTS FOR MATERIALS AND FABRICATION ARE DESCRIBED IN THE SPECIFICATIONS. FOR CONVENIENCE, CERTAIN EXTRACTS ARE REPRODUCED BELOW. IN THE EVENT OF A CONFLICT THE MORE STRINGENT REQUIREMENT SHALL GOVERN.

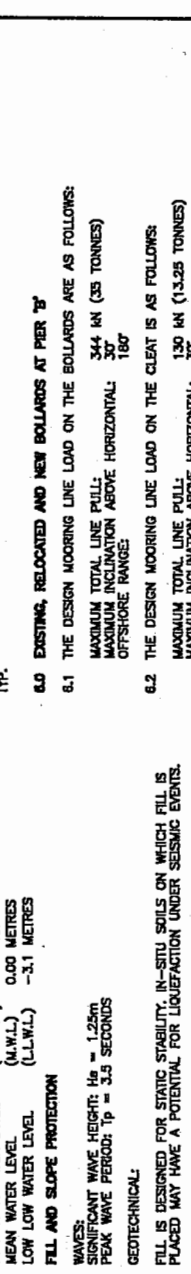
1.2 DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

1.3 THE DIMENSIONS AND DETAILS OF THE EXISTING STRUCTURES ARE APPROXIMATE AND MAY BE SUBJECT TO CONSTRUCTION VARIATIONS. THE CONTRACTOR SHALL VERIFY THE EXISTING STRUCTURAL DIMENSIONS AND DETAILS INCLUDING THE SIZE, DRESSING AND LENGTH OF REPLACEMENT TIMBERS PRIOR TO PROCURING MATERIALS.

1.4 THE CONTRACTOR SHALL COORDINATE ALL ACTIVITIES WITH THE OWNER. LOCATION OF THE CONTRACTOR'S SITE OFFICE AND MATERIALS STORAGE SHALL BE APPROVED BY THE OWNER.

ITEMS THAT ARE INCIDENTAL TO THE WORK, SUCH AS TEMPORARY REMOVAL AND REINSTATEMENT OF HARDWARE INCLUDING STRUCTURAL BOLTS, NUTS AND OTHER MISCELLANEOUS ITEMS SHALL BE INCLUDED IN THE PRICE. WATER MAINS SHALL BE MAINTAINED IN OPERATION AT ALL TIMES.

1.6 CONTRACTOR TO CONFIRM ALL WORKS PERFORMED SHALL BE CERTIFIED AS HAVING A MINIMUM LIFE SPAN OF 25 YEARS AND DURABLE SUCH THAT Ongoing MAINTENANCE AND REPAIR COSTS WILL NOT BE GREATER THAN TYPICALLY EXPECTED.



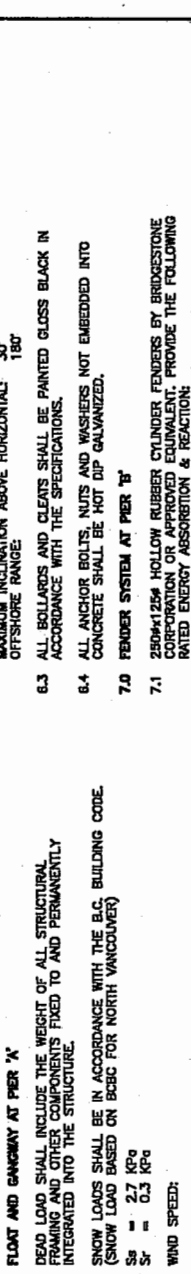
GENERAL NOTES

7.0 DESIGN VESSEL:

7.1 HALFAX CLASS FRIGATE

7.2 BERTHING CRITERIA:

- MAXIMUM BERTHING VELOCITY PERPENDICULAR TO BERTH FACE = 0.15m/s
- MAXIMUM ANGLE OF APPROACH = 10 DEGREES
- QUARTER POINT BERTHING



GENERAL

7.1 250Mx125M HOLLOW RUBBER CYLINDER FENDERS BY BRIDGESTONE CORPORATION OR APPROVED EQUIVALENT. PROVIDE THE FOLLOWING RATED ENERGY ABSORPTION & REACTION:

- 4-800 TONNES PER LINEAL METRE (MINIMUM)
- 8-1222 TONNES PER LINEAL METRE (MAXIMUM)

7.2 196 STUD LINK CHAIN GRADE 2 WITH THE FOLLOWING MINIMUM TEST REQUIREMENTS:

- DIAMETER: 130mm
- LOAD: 130kN
- MAXIMUM INCLINATION ABOVE HORIZONTAL: 180°
- MINIMUM BREAK LOAD: 212kN

7.3 196 SHACKLES TO BE H-TEST WITH THE FOLLOWING MINIMUM TEST REQUIREMENTS:

- WORKING LOAD: 42kN
- SAFE WORKING LOAD: 222kN

7.4 CHAINS, SHACKLES, U-BOLTS & MISCELLANEOUS FITTINGS TO BE HOT DIP GALVANIZED IN ACCORDANCE WITH CSA STANDARD G164

7.5 THE FENDER SYSTEM FOR PIER 'B' PROVIDES EQUAL OR BETTER DEFLECTION CAPACITY TO THAT PROVIDED FOR PIER 'A' UNDER SYSTEM FENDERING REQUIRED BEYOND THAT PROVIDED IS THE RESPONSIBILITY OF INDIVIDUAL VESSELS.



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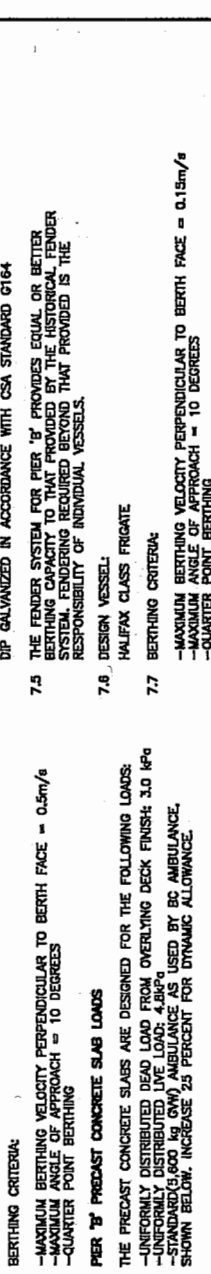
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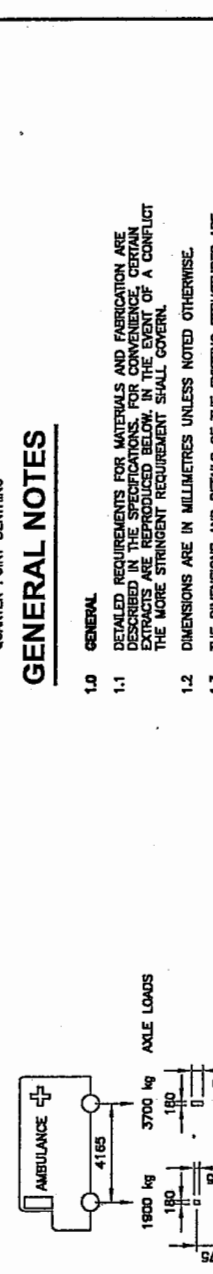
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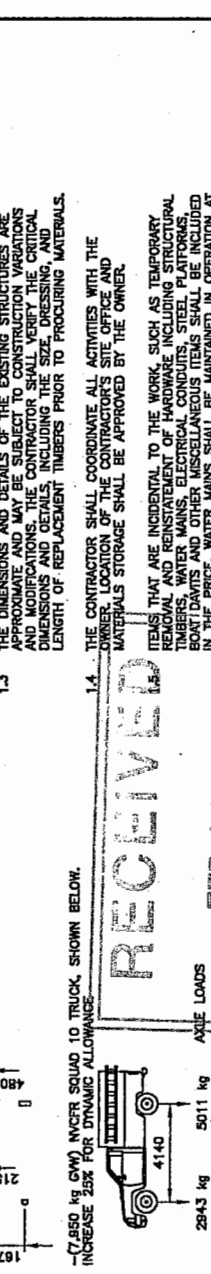
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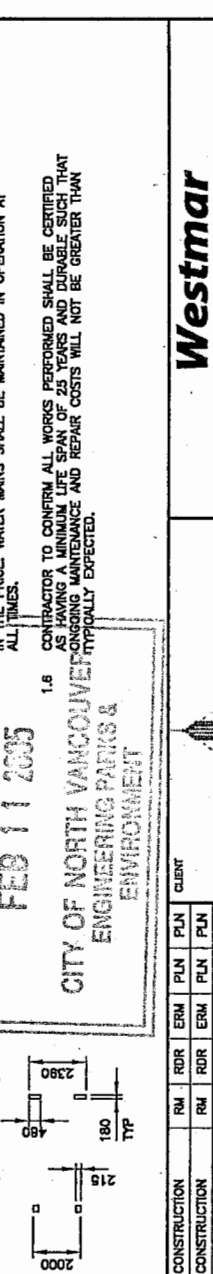
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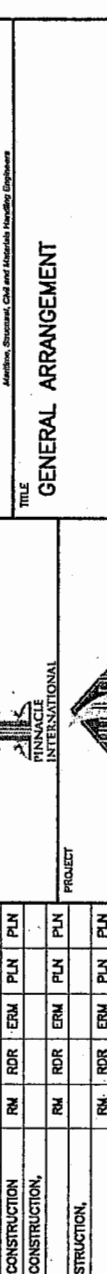
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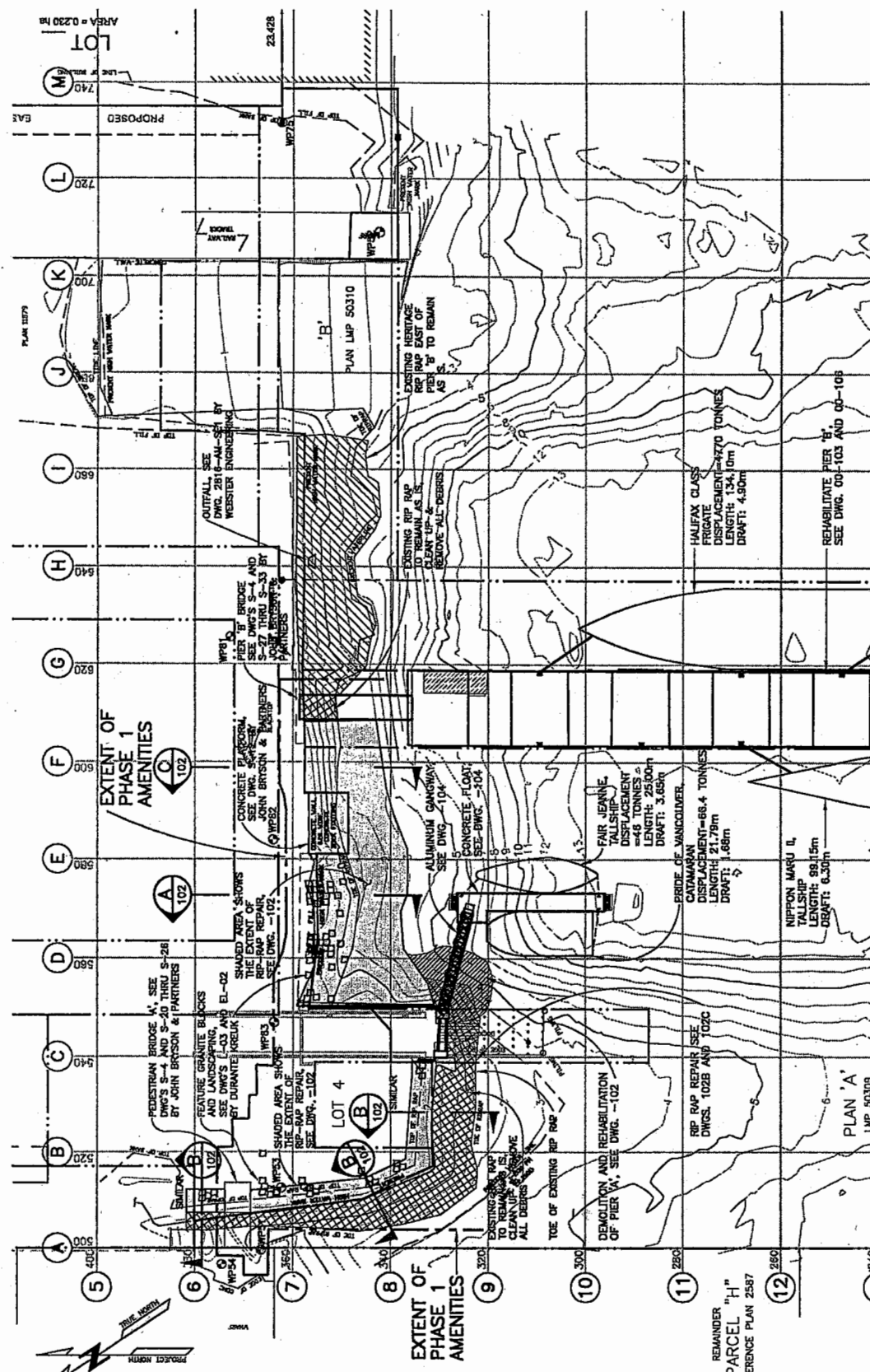
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**SURVEY CONTROL POINTS**  
(PROJECT COORDINATE SYSTEM)

WORK POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
WP51	386.391	489.656	4.808	NAIL ON WOOD RAIL
WP52	342.374	708.670	4.350	CONCRETE NAIL
WP53	362.295	512.483	-	OLD IRON PIN
WP54	374.412	498.632	-	OLD IRON PIN
WP55	362.321	731.721	-	OLD IRON PIN
WP56	372.653	625.614	3.713	CONCRETE NAIL
WP57	363.941	594.060	3.377	CONCRETE NAIL
WP58	363.923	546.988	2.562	CONCRETE NAIL

**INTEGRATED SURVEY AREA**

1.0 PROJECT CO-ORDINATE SYSTEM DEFINITION

1.1 PROJECT GRID ORIGIN LOCATED (NOT SHOWN) AT SOUTHWEST CORNER OF LOT 5, (FORMER PLOT 16).

PROJECT GRID ORIENTATION IS PARALLEL AND PERPENDICULAR TO LONSDALE AVE. (ASSUMED 0700700)

PROJECT ORIGIN: N=500,000 E=500,000 (METRES)

2.0 PROJECT CO-ORDINATE TIE-IN TO UTM CO-ORDINATE SYSTEM

2.1 UTM CO-ORDINATES MON 87H3688: N 5462124.602 E 494285.260 (PUBLISHED UTM)

PROJECT CO-ORDINATES PT 1: N 627.850 E 487.041 (GROUND)

UTM SHIFT: N 5467486.752 E 487988.219

2.2 UTM GRID BEARING FROM MON 87H3688 TO MON 73H1028 = 123.4158°

PROJECT BEARING FROM PT 1 TO PT 2 = 85.5242°

ROTATION (CLOCK WISE FROM NORTH) MON 87H3688 = 33.4310°

2.3 GRID BEARINGS ARE DERIVED FROM OBSERVATIONS FROM CONTROL MONUMENT 87H1028 AND 87H3688 INTEGRATED SURVEY AREA #44, INDS, (S.S.525), CITY OF NORTH VANCOUVER.

2.4 THIS PLAN SHOWS GROUND LEVEL MEASUREMENT DISTANCES. PRIOR TO COMPUTATION OF U.T.M. CO-ORDINATES, MULTIPLIED BY A COMBINED SCALE FACTOR OF 0.9998003.

2.5 THE ABOVE SURVEY INFORMATION FOR PROJECT CO-ORDINATE SYSTEM AND TIE-IN TO UTM HAS BEEN DERIVED FROM DRAWING FILE L12624-49 BY BENNETT & ASSOCIATES DATED JANUARY 7, 2004.

**Westmar**  
Architect, Structural, Civil and Mechanical Engineering

**GENERAL ARRANGEMENT**

CLIENT: CITY OF NORTH VANCOUVER ENGINEERING PARTS & ENVIRONMENT

PROJECT: PIER 'B' REPAIR AND RECONSTRUCTION

No.	DATE	DESCRIPTION	ISSUE / REVISIONS
E	JUN11/04	PHASE 1 AMENITIES - RE-ISSUED FOR CONSTRUCTION	RM, RDR, ERM, PLN, PLN
D	FEB23/04	PHASE 1 AMENITIES - RE-ISSUED FOR CONSTRUCTION	RM, RDR, ERM, PLN, PLN
E	JAN27/04	PHASE 1 AMENITIES - RE-ISSUED FOR CONSTRUCTION	RM, RDR, ERM, PLN, PLN
D	JAN15/04	PHASE 1 AMENITIES - RE-ISSUED FOR CONSTRUCTION	RM, RDR, ERM, PLN, PLN
C	DEC10/03	PHASE 1 AMENITIES - ISSUED FOR CONSTRUCTION	RM, RDR, ERM, PLN, PLN
B	FEB09/05	AS CONSTRUCTED	RM, RDR, ERM, PLN, PLN
F	JUL26/04	ISSUED FOR CONSTRUCTION - PHASE 1 AMENITIES	RM, RDR, ERM, PLN, PLN
G	FEB09/05	AS CONSTRUCTED	RM, RDR, ERM, PLN, PLN
H	FEB09/05	AS CONSTRUCTED	RM, RDR, ERM, PLN, PLN
I	FEB09/05	AS CONSTRUCTED	RM, RDR, ERM, PLN, PLN
J	FEB09/05	AS CONSTRUCTED	RM, RDR, ERM, PLN, PLN
K	FEB09/05	AS CONSTRUCTED	RM, RDR, ERM, PLN, PLN
L	FEB09/05	AS CONSTRUCTED	RM, RDR, ERM, PLN, PLN
M	FEB09/05	AS CONSTRUCTED	RM, RDR, ERM, PLN, PLN

DRAWN: CHKD DESIGN: CHKD APP'D: [Signature]

ISSUE / REVISIONS

SCALE: 1:600

PROJECT NUMBER: 02719

DRAWING NUMBER: 00-101

REVISION: G

