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NOTES

- DO NOT SCALE FROM THIS DRAWING. ALL DIMENSIONS MUST BE CHECKED AND VERIFIED ON SITE.
- DETAILS ON THIS DRAWING ASSUMES A STRAIGHT AND LEVEL FOUNDATION RUN. IF THE PROPOSED LAYOUT REQUIRES A DIFFERENT LAYOUT THAN THAT PROVIDED ON THIS DRAWING CONTACT MFD INTERNATIONAL FOR ALTERNATIVE DESIGN SOLUTION.
- STANDARD DETAILS TO BE COMBINED TO FORM APPROPRIATE NO. OF BOLLARDS/RUN. ALL RUNS MUST HAVE THE APPROPRIATE STANDARD ENDS.
- SEPARATE BENDING SCHEDULE MUST BE USED EACH TIME A SECTION IS REQUIRED E.G. FOR 2x "INNER 4N" BOLLARD RUN" USE 2x APPROPRIATE BENDING SCHEDULE.

EXCAVATION

- ALL EXCAVATIONS PREFERABLY TO BE HAND DUG DUE TO THE PRESENCE OF EXISTING SERVICES.
- AREAS TO BE EXCAVATED SHOULD BE CAT SCANNED PRIOR TO AND AT REGULAR INTERVALS DURING EXCAVATION, TO LOCATE THE PRESENCE OF SERVICES.
- WHERE EXCAVATION IS OVER-DUG, BACKFILL AROUND BASES SHALL BE IN MASS CONCRETE.
- MIN. GROUND SAFE BEARING PRESSURE 100kN/m²

BLINDING

- SURFACES TO RECEIVE SHEET OVERLAYS OR CONCRETE TO HAVE 50mm OF BLINDING.
- PERMISSIBLE DEVIATIONS ON SURFACE LEVEL: +0 -25mm.

MORTAR FILLING/BEDDING OF BOLLARDS

- SURFACES FILLED WITH:
 - UP TO 50mm - GROUT
 - 50 TO 80mm - DAMP MORTAR OF 1:2 CEMENT, SAND
 - GREATER THAN 80mm - MASS CONCRETE
- WELL TAMPED AGAINST PROPERLY FIXED SUPPORTS AS FILLING PROCEEDS.
- CEMENT: PORTLAND CEMENT TO BS EN 197-1 - CEM 42.5 OR CLASS 52.5.
- SAND: TO BS 882, GRADING LIMIT M OR EQUIVALENT TO BS EN 12620.

GROUT

- GROUT USED FOR INFILL AROUND BOLLARDS TO BE COMBEXTRA HF MANUFACTURED BY FOSROC OR SIMILAR INCLUDING PRE-SCANNING OF PRE-FORMED POCKET WHERE REQUIRED BY MANUFACTURER.
- THE CONTRACTOR IS TO ENSURE THAT PRIOR TO POURING THE GROUT THE AREA IS FREE FROM WATER AND DEBRIS, OIL, GREASE OR ADHERENT MATERIAL. IF THE CONCRETE SURFACE IS DEFECTIVE, IT MUST BE CUT BACK TO A SOUND BASE.
- THE CONTRACTOR MUST DEMONSTRATE THAT THERE ARE NO GAPS, AND THAT NO CRACKS DEVELOP ONCE THE GROUT HAS BEEN POURED.

CONSTRUCTION

- CONSTRUCTION JOINT TO BE:
 - PLACED MID WAY BETWEEN BOLLARDS
 - AT MAXIMUM OF 15m CENTRES
- MAXIMUM CLEAR DISTANCE BETWEEN BOLLARDS TO BE 1200mm.

FOR STANDARD REINFORCED CONCRETE DETAILS REFER TO DRAWING Nr. 3824/000/204

THE STANDARD REBAR DESIGN AND CONFIGURATION CAN BE USED UP TO A MAXIMUM SLOPE OF 1:10 OR 6° SLOPE ANGLE. THEREFORE UP TO THIS SLOPE ANGLE THE LINKS DO NOT HAVE TO REMAIN VERTICAL. THE ENTIRE REBAR CAGE CAN BE LAID TO A FALL.

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REV	DATE	DESCRIPTION	MDL	APJ
A	15.06.12	ISSUED FOR CONSTRUCTION	MDL	APJ



Montfort Lodge
Botley Road
Romsey
Hampshire
SO51 5SW
United Kingdom

t: +44 (0)1794 516171
f: +44 (0)1794 524460
e: mail@mfdgroup.co.uk
www.mfdgroup.co.uk

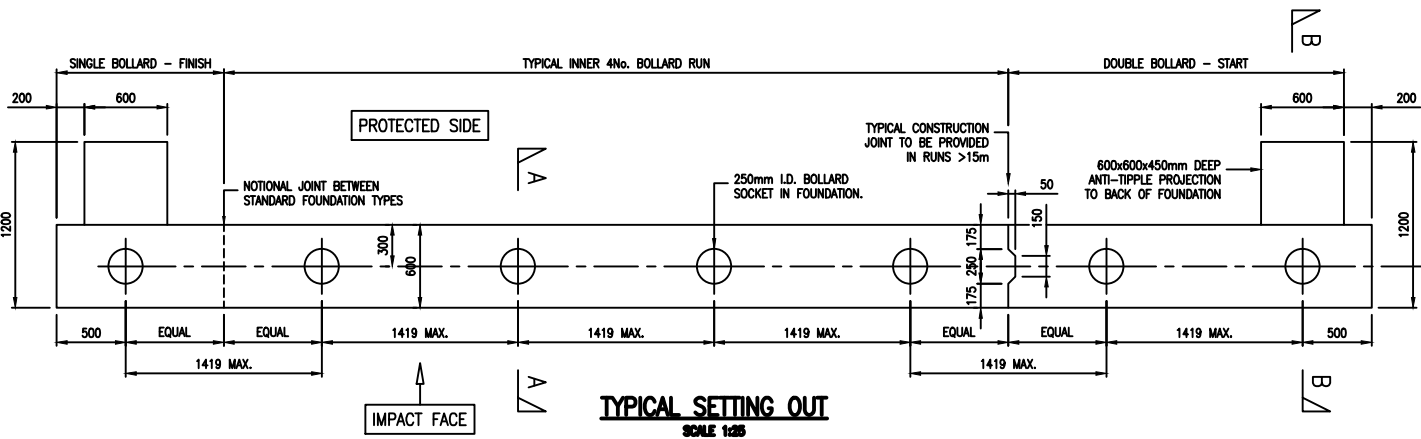


PROJECT

TITLE
MARS - 219mm dia
BOLLARD STANDARD
FOUNDATIONS DETAILS (7.5T
AT 30mph)

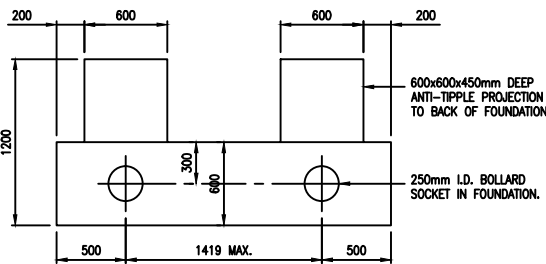
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DESIGN/CAD	MDL	REVIEWED BY	APJ
DRAWING NUMBER	3824/000/203	REV	A

CONSTRUCTION ISSUE



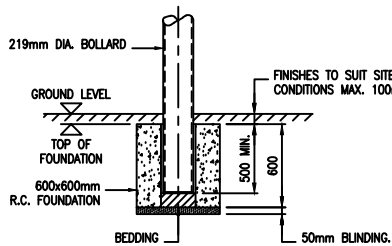
TYPICAL SETTING OUT

SCALE 1:25



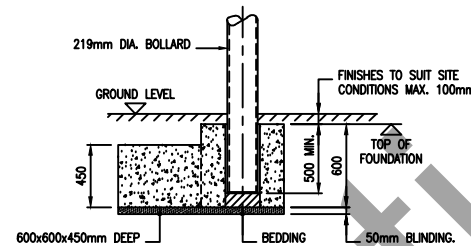
DOUBLE BOLLARD SETTING OUT

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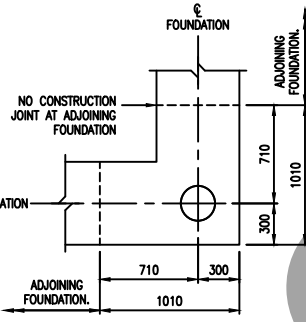
SECTION A-A

SCALE 1:25



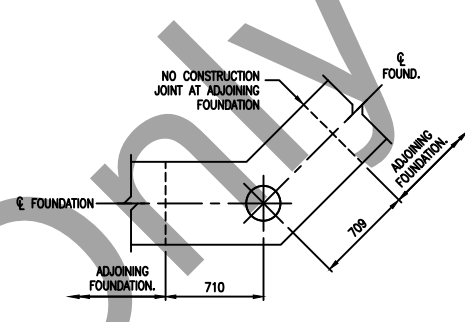
SECTION B-B

SCALE 1:25



90° CORNER SETTING OUT

SCALE 1:25



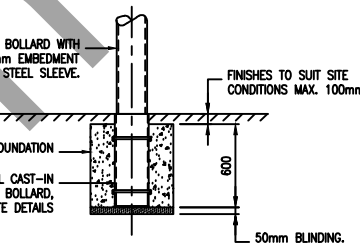
45° CORNER SETTING OUT

SCALE 1:25



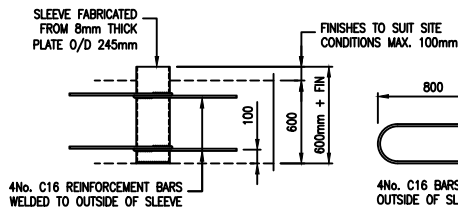
SCALE BAR 1:25

FOR STANDARD REINFORCED CONCRETE DETAILS
REFER TO DRAWING Nr. 3824/000/204



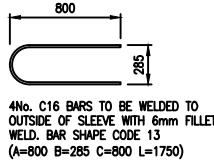
REMOVABLE BOLLARD

SCALE 1:25



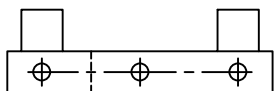
CAST-IN SLEEVE DETAILS

SCALE 1:25

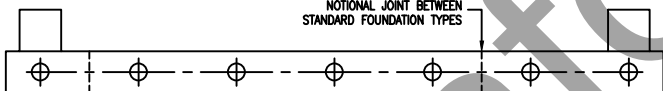


GENERIC BOLLARD ARRANGEMENTS

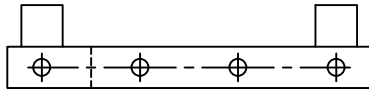
POSSIBLE ARRANGEMENTS FOR INFORMATION BUT NOT LIMITED TO THOSE SHOWN BELOW



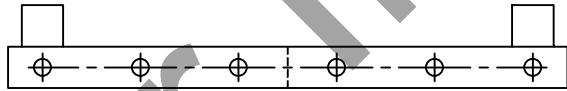
STRAIGHT 3Nr. BOLLARD ARRANGEMENT
1Nr. DOUBLE BOLLARD - START
1Nr. SINGLE BOLLARD - FINISH



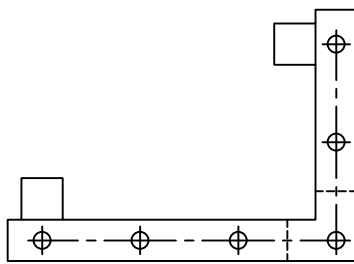
STRAIGHT 7Nr. BOLLARD ARRANGEMENT
1Nr. DOUBLE BOLLARD - START
1Nr. INNER BOLLARD RUN
1Nr. SINGLE BOLLARD - FINISH



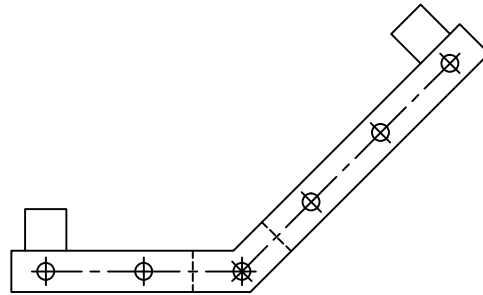
STRAIGHT 4Nr. BOLLARD ARRANGEMENT
1Nr. TRIPLE BOLLARD - START
1Nr. SINGLE BOLLARD - FINISH



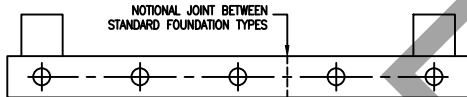
STRAIGHT 6Nr. BOLLARD ARRANGEMENT
1Nr. TRIPLE BOLLARD - START
1Nr. TRIPLE BOLLARD - FINISH



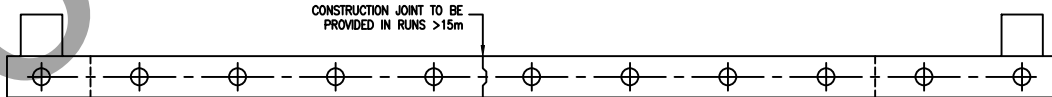
90° CORNER 6Nr. BOLLARD ARRANGEMENT
1Nr. DOUBLE BOLLARD - START
1Nr. 90° CORNER
1Nr. TRIPLE BOLLARD - FINISH



45° CORNER 6Nr. BOLLARD ARRANGEMENT
1Nr. TRIPLE BOLLARD - START
1Nr. 45° CORNER
1Nr. DOUBLE BOLLARD - FINISH



STRAIGHT 5Nr. BOLLARD ARRANGEMENT
1Nr. DOUBLE BOLLARD - START
1Nr. TRIPLE BOLLARD - FINISH



STRAIGHT 11Nr. BOLLARD ARRANGEMENT
1Nr. DOUBLE BOLLARD - START
2Nr. INNER BOLLARD RUN
1Nr. SINGLE BOLLARD - FINISH



SCALE BAR 1:50