

SPECIFICATION FOR LAYING OF UNDERGROUND CABLES UP TO 22 KV

NS 130 (ENERGY AUSTRALIA)

- H V AND L.V CABLE INSTALLATIONS IN SYDNEY'S CENTRAL BUSINESS DISTRICT ARE GENERALLY PIT AND DUCT CONFIGURATIONS.
- ALL EXCAVATION AND CABLE LAYING OPERATIONS SHALL BE CARRIED OUT WITH THE LEAST POSSIBLE OBSTRUCTION TO TRAFFIC
 - AS 1742 MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES
 - ROAD AND TRAFFIC AUTHORITY 'TRAFFIC CONTROL AT WORKSITES MANUAL'.

- WORKS IN PROGRESS SIGNS MUST BE DISPLAYED
- ENVIRONMENTAL REQUIREMENT, ENVIRONMENTAL IMPACT ASSESSMENT SHALL BE CONDUCTED PRIOR TO THE COMMENCEMENT OF WORK.
- ALL DISTRIBUTION CABLES SHALL BE LAID IN APPROVED CONDUITS ACROSS ROADWAYS TO ALLOW FOR FUTURE SYSTEM ALTERATIONS / AUGMENTATIONS WITH MINIMAL CIVIL WORK.
- WHERE CABLE ROUTE CROSSES CONCRETE FORMED (OR) PAVED DRIVEWAYS SPECIAL PRECAUTIONS SHALL BE TAKEN TO ENSURE MINIMAL DAMAGE TO SUCH DRIVEWAYS
- ALL NEW RAIL CROSSINGS (OVERHEAD (OR) UNDERGROUND) SHOULD ALLOW FOR ALL POLES (OR) THE ENDS OF CONDUIT BANKS TO BE LOCATED OFF RAIL PROPERTY
- CONDUITS SHOULD BE RUN THE FULL WIDTH OF THE RAIL CORRIDOR.

- CONDUITS FOR INSTALLATION OF FIBRE OPTIC PILOT CABLES

FOR ALL NEW INSTALLATIONS, A MINIMUM OF ONE ORANGE 50MM CONDUIT FOR THE PURPOSE OF OPTIC FIBRE CABLE MUST BE INSTALLED WITH EVERY TRENCHED UNDER GROUND CABLE.

SURVEY PLAN

RED LINED PLAN

WHERE CABLES (OR) SUBSTATIONS ARE TO BE LOCATED ON PRIVATE PROPERTY, A SURVEY (LEASE / EASEMENT) PLAN IS REQUIRED.

SETTING OUT OF EXCAVATIONS

THE PROPOSED EXCAVATION FOR TRENCHES, PITTS AND KIOSK SITES MUST BE SET IN ACCORDANCE WITH AWS SPEC 1152

DIMENSION OF TRENCHES DEPEND ON

- NUMBER AND TYPES OF CABLES
- NUMBER OF CONDUITS
- LOCATION OF TRENCHES
- SHARED TRENCHING AGREEMENT.

- DETAILED INSTALLATION WORK COMPOSES OF THE APPROPRIATE TASKS FOR

- (1) SETTING OUT FOR EXCAVATIONS IN NEW SUB DIVISIONS
- (2) SETTING OUT FOR EXCAVATIONS IN ESTABLISHED AREAS

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- (1) SETTING OUT FOR EXCAVATIONS IN NEW SUB DIVISIONS
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(3) LOCATING EXISTING SERVICES

(4) EXCAVATION OF TRENCHES

(5) EXCAVATION OF JOINT HOLES

(6) EXCAVATION OF SUBSTATION SITES

NS 117 - DESIGN STANDARDS FOR KIOSK SUBSTATIONS

NS 141 - SITE SELECTION AND SITE PREPARATION STANDARDS FOR KIOSK TYPE SUBSTATIONS

NS 165 - CONSTRUCTION WORK IN SUBSTATIONS.

(7) PROTECTION OF TREES.

INSTALLATION OF CONDUITS

UNPLASTICIZED POLY VINYL CHLORIDE (UPVC)
ORANGE CONDUITS FOR UNDER GROUND CABLING
AS A MINIMUM STANDARD.

CONDUIT SIZE	GENERAL APPLICATION
90 mm	L.V SERVICE IN ACCORDANCE WITH NEW SERVICE & INSTALLATION RULES FIBRE OPTIC CABLE TO SUPPORT ELECTRICITY NETWORK
100 mm	L.V SERVICE SUPPLIED FROM L.V PITTS
125 mm	DISTRIBUTION CABLES (H.V, L.V, STREET LIGHTING)
150 mm	11 KV 500mm ² 3 CORE CABLE COMPLEX INSTALLATIONS

EXAMPLE INSTALLATIONS

INSTALLATION TYPE	CONDUIT
STATE RAIL CROSSINGS	125 mm LIGHT DUTY UPVC
CONDUITS IN FOOTWAYS LOCAL & REGIONAL ROADWAY CROSSINGS	AS/NZS 2053.2
L.V SERVICE	100 mm L.D UPVC AS/NZS 2053.2
L.V DOMESTIC SERVICE SUBSTATION CHAMBERS FIBRE OPTIC	50 mm HEAVY DUTY (HD) UPVC AS/NZS 2053.2

INSTALLATION OF CONDUITS — DETAILED CONSTRUCTION

CONDUIT COUPLING — USE SPIGOT / SOCKET ARRANGEMENT
PVC SOLVENT CEMENT FOR MATING SURFACES

CONDUIT BEND — APPROPRIATE BENDING RADIUS

SEALING — ALL CONDUITS MUST BE SEALED AGAINST
WATER & FOREIGN MATERIALS

USE MOULDED PLASTIC PLUGS

LAYING CONDUIT — PAY ATTENTION FOR CROSSINGS

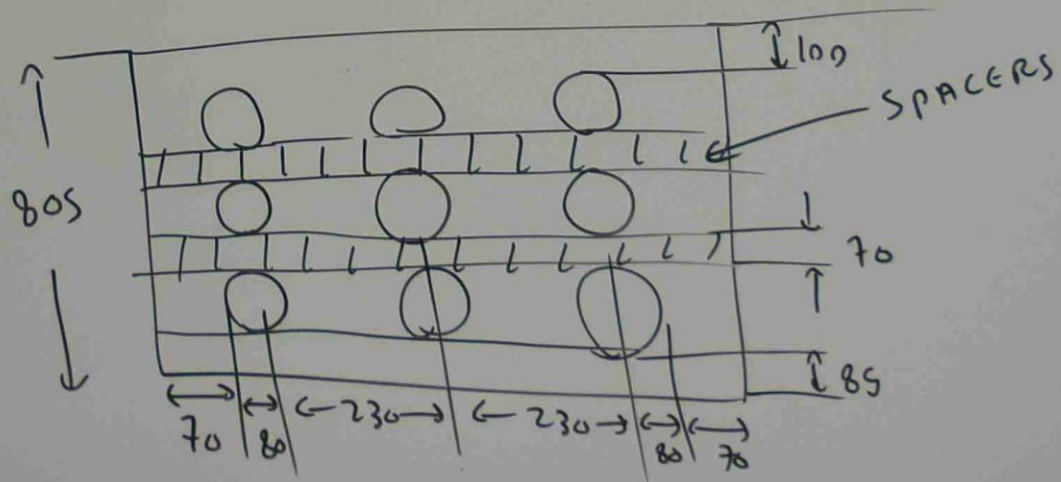
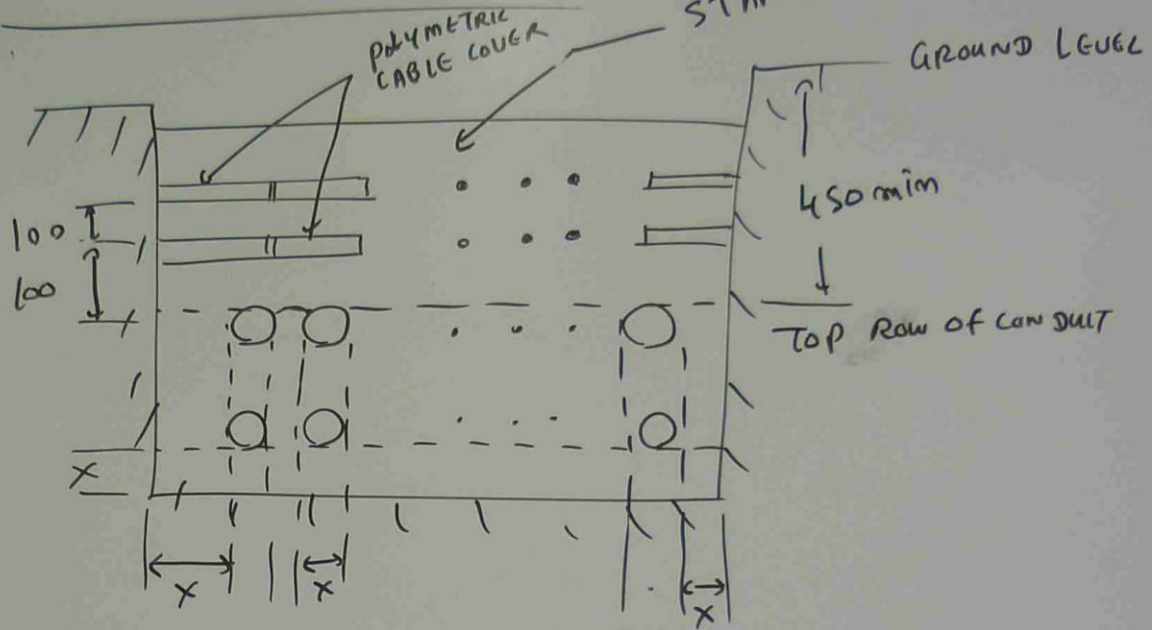
STANDARD CONDUIT & CABLE SPACING

50 mm FOR 125 mm CONDUIT

70 mm FOR 150 mm CONDUIT

TOP LAYER OF CABLES SHALL BE COVERED
WITH 100 mm BEDDING.

H.V CONDUITS IN FOOTWAY



BEDDING MATERIALS

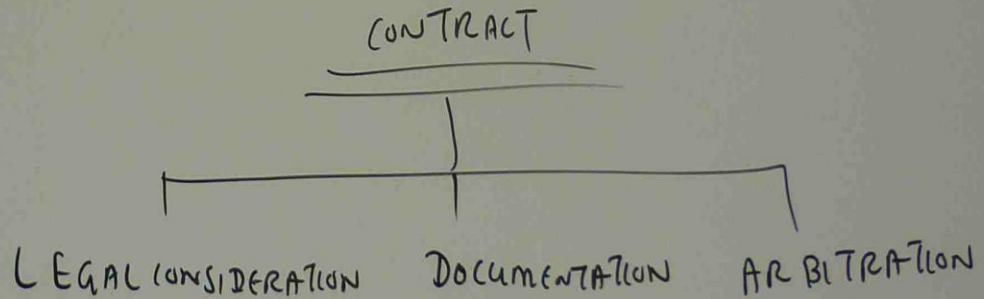
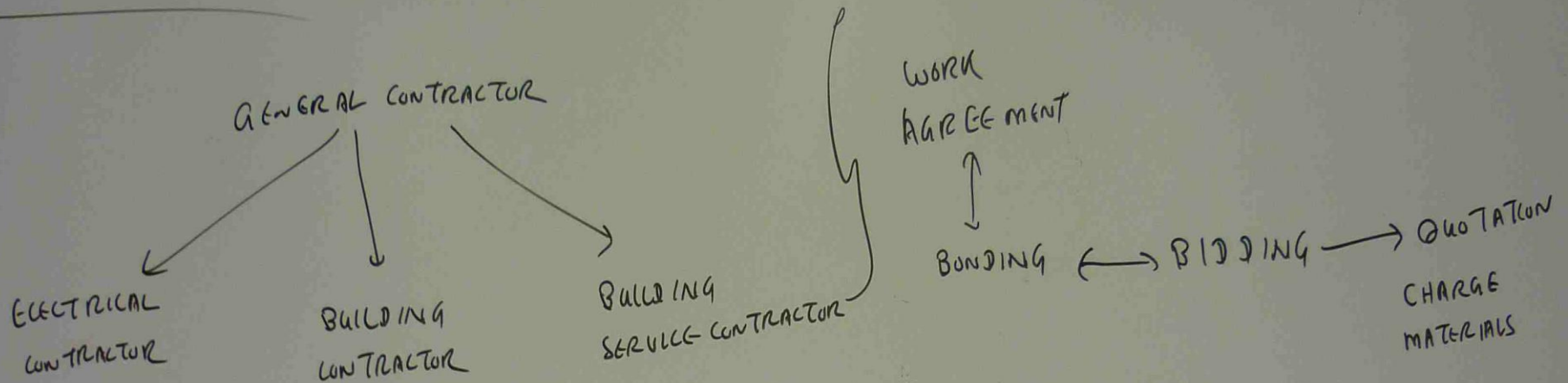
DRY MIX

COARSE AGGREGATE + FINE AGGREGATE + FLY ASH
+ CEMENT + WATER

REGULAR MIX

ELECTRICAL CONTRACTING

CONTRACT BID WORK



BONDING

- FOR CONTRACT BID WORK, BONDING CAN BE CRITICAL. IN RETURN FOR A FEE (USUALLY AROUND 1.2% OF THE CONTRACT PRICE)
- A BONDING COMPANY WILL GUARANTEE THE PROJECT COMPLETION TO THE OWNER'S GENERAL CONTRACTOR FOR THE SPECIFIED AMOUNT.

BONDING COMPANIES

- NEED THE FINANCIAL STABILITY OF CONTRACTORS.
- THE CONTRACTOR NEEDS TO IMPRESS BONDING COMPANY'S AGENT

CONTRACTS

- THE CONTENTS OF CONTRACT IS VERY IMPORTANT
- THE CONTRACT SPELLS OUT EXACTLY HOW THE JOB WILL BE RUN
- NEED TO CLARIFY THE MEANING OF CONTRACT BY ATTORNEY
- TRY TO MAKE REASONABLE CHANGE TO CONTRACT.

DOCUMENTATIONS

ORAL COMMUNICATION IS VIRTUALLY IMPOSSIBLE TO PROVE AT COURT.

JOB DELAYS, CHANGE ORDERS, EARLY ACCEPTANCE ETC MUST BE FORMALLY WRITTEN DOWN

ARBITRATION

- A METHOD OF RESOLVING CONTRACT DISPUTES WITHOUT GOING THROUGH THE REGULAR LEGAL CHANNELS
- THE DISPUTE IS RESOLVED BY AN IMPARTIAL JUDGE MUTUALLY SELECTED BY BOTH PARTIES
- CHEAPER IN RESOLVING MATTER AT COURT.

BIDDING

PRE BID INFORMATION CHECK LIST

BIDDING INFORMATION

NAME OF JOB

LOCATION

START DATE

END DATE

FINANCE INFORMATION

BID BOND

CONSTRUCTION TIME

LIQUIDATED DAMAGES

WAGE RATE

QUOTES REQUIRED

EQUIPMENTS

DESIGN INFORMATION

ARCHITECT

ENGINEER

OWNER

CONSTRUCTION INFORMATION

SPECIFICATIONS OF EQUIPMENTS

BIDDING

COST RESPONSIBILITY OF PART OF THE JOB

QUOTE SHEET

JOB _____ DATE _____

SUPPLIER	ITEM	PRICE	BILL OF MATERIAL	DATE & TIME

BID SUMMARY

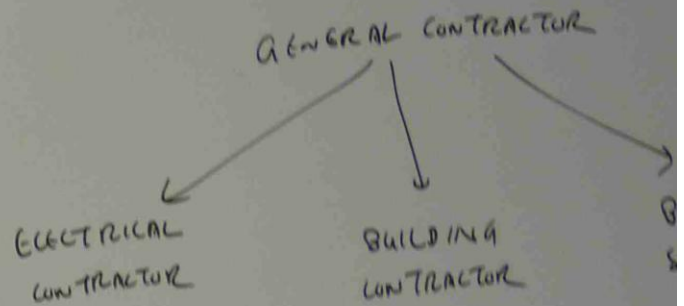
PROJECT _____ BID DATE _____

MATERIAL _____

FINANCE _____

ELECTRICAL CONTRACTING

CONTRACT BID WORK



MATERIAL COST

→ SALE TAX

HOURS _____

JOB COST _____

NET COST _____

TOTAL _____