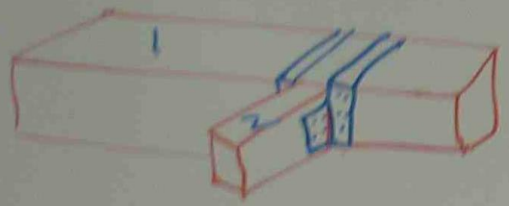
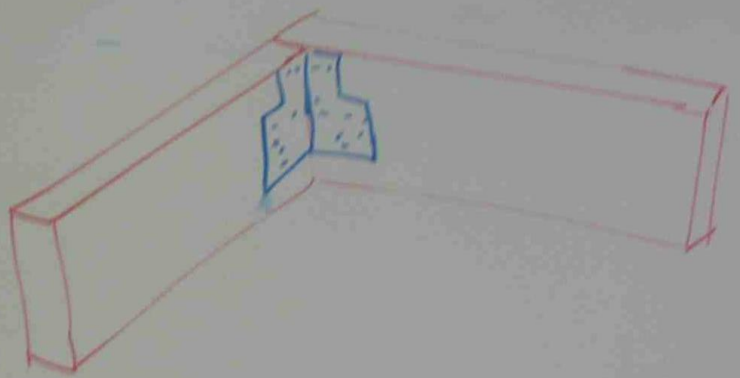
FIXING ACCESSORIES





JOIST HANGER 90°, 120°, 30°

HOT DIPPED GALVANIZED MILD STEEL

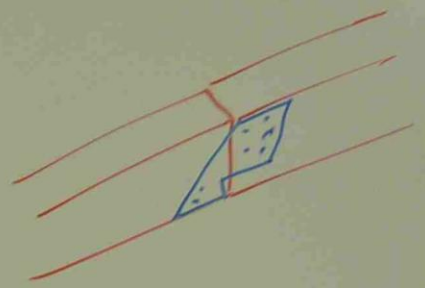
2.7mm TO 1mm THICK

FRAMING ANCHORS

1.2mm GALVANIZED STEEL
32mm LONG
3.7mm SQUARE TWISTED NAIL

THESE DEVICES ARE INTENDED TO MAKE CONNECTIONS BETWEEN TIMBER JOISTS MEETING AT RIGHT ANGLES.

CANTI LEVER BRACKET

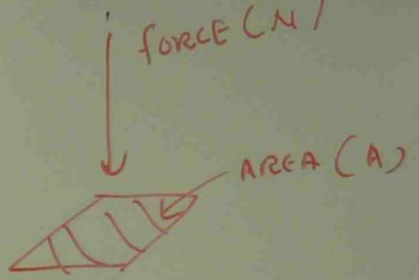


CANTI LEVER BRACKET

STRENGTH OF MECHANICAL FIXINGS IN TIMBER BASES

THE STRENGTH OF MECHANICAL FIXINGS TO TIMBER BASES IS AFFECTED BY THE SPECIES OF TIMBERS.

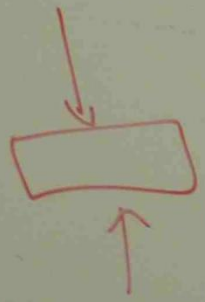
SPECIES	DENSITY kg/m^3	MAXIMUM BENDING STRENGTH (N/mm^2)	MAXIMUM COMPRESSION STRENGTH (N/mm^2)
PITCH	769	107	56.1
DOUGLAS	545	93	52.1
EUROPEAN LARCH	545	92	46.7
BALTIC RED WOOD	481	83	45.0
WESTERN HEMLOCK	465	83	47.4
EUROPEAN SPRUCE	417	72	36.5
WESTERN RED CEDAR	368	65	35.0



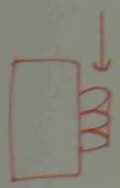
$$\text{STRESS} = \frac{\text{FORCE}}{\text{AREA}}$$

$$= \frac{F}{A} \quad \left(N/mm^2\right)$$

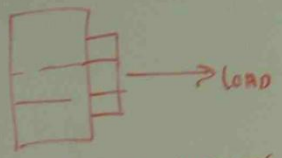

BENDING


COMPRESSION

LOADING



LATERAL LOAD

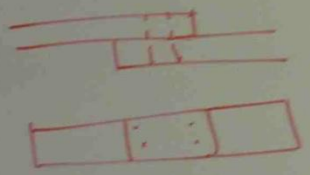


AXIAL LOADING

DIAMETER OF NAIL mm	THICKNESS OF PLY (mm)
2.64	8.0
3.25	9.5
3.66	12.7
4.47	15.8

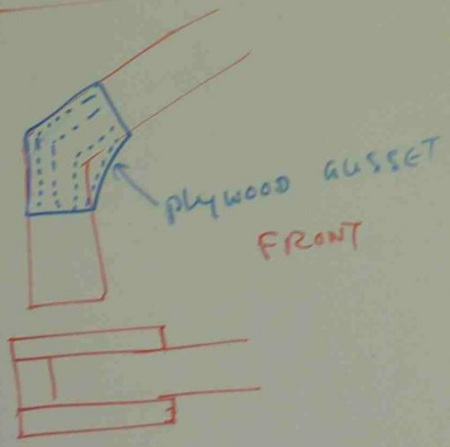
LAP JOINT

FRONT



PLAN

GUSSETTED JOINT



FRONT

PLAN

SPACING OF NAILS, SCREWS, BOLTS

TYPE OF FIXING	DISTANCE	
	PRE-DRILLED HOLE	NO HOLE
NAIL, SCREW	10D	20D
D = NAIL DIAMETER		
BOLT	7D	

CORROSION

DAMPNESS CAN BE A CAUSE OF CORROSION IN FERROUS TIMBER FIXINGS.

ZINC COATED FIXING IS TO BE APPLIED FOR PREVENTING WEATHER CORROSION.

WHEN METAL FASTENERS ARE USED IN TIMBER IMPREGNATED WITH FLAME RETARDANTS, THE MANUFACTURER'S ADVICE SHOULD ALWAYS BE SOUGHT.

NON CORRODING FASTENERS

PHOSPHOR

SILICON BRONZE

MECHANICAL FIXINGS IN MASS WALLING BASES

DENSITY AND COMPRESSIVE STRENGTH ARE TWO MAIN CHARACTERISTICS THAT MOST AFFECT FIXING PERFORMANCE.

DRILL FOR FIXING

DRILL BIT — HARD CARBIDE TIP

METHOD	SUITABILITY
(1) BY HAND USING PRECUSION TOOL	SLOW, LABOURIOUS ACCURATE HOLE SMALLER PLUG TYPE FIXING
(2) HAND ROTARY DRILL	ACCURATE HOLE SLOW PROCESS
(3) ELECTRIC ROTARY DRILL	ACCURATE FASTER BUT SLOW METHOD FOR HOLE DIAMETER EXCEEDS 16mm
(4) ELECTRIC ROTARY IMPACT TOOL	ACCURATE METHOD FOR HARD WALLS

METHOD	SUITABILITY
(5) ELECTRIC HAMMER DRILL	QUICK METHOD OF FORMING HOLE UP TO 24 mm DIAMETER REASONABLE ACCURACY IN DENSE CONCRETE
(6) PNUEMATIC HAMMER DRILL	FASTEST METHOD — HOLE ACCURACY AND SHAPE ARE NOT ALWAYS BE AS GOOD AS THEY MIGHT BE LARGE DIAMETER HOLES FOR HEAVY DUTY CIVIL ENGINEERING JOB.

SOLDERING

SAFETY

ALWAYS HAVE THE SOLDERING IRON POSITIONED SO THAT IT IS READILY ACCESSIBLE AND LEADS ARE NOT LYING ACROSS THE WORK AREA

WHY SOLDER

GOOD ELECTRICAL & MECHANICAL CONNECTION FOR RELIABLE OPERATION

- ABILITY OF JOINT TO BE REWORKED

JOINING METAL COMPONENTS

EPOXY — GIVE MECHANICAL STRENGTH
DOES NOT PROVIDE GOOD ELECTRICAL CONNECTION
– DIFFICULT TO REMOVE

WELDING - EXPENSIVE
DIFFICULT TO REMOVE
GOOD MECHANICAL ELECTRICAL CONNECTION

ECHANICAL FASTENING — AFFECTED BY VIBRATION

OFT SOLDERING

FT SOLDERING PROVIDES GOOD ELECTRICAL
D MECHANICAL CONNECTION. IT IS EASY TO
EWORK AND PROTECTION FROM CORRISION

SOLDERING PROCESS

SOLDERING IS THE PROCESS BY WHICH TWO METALS CAN BE JOINED TO FORM A SOLID CONNECTION.

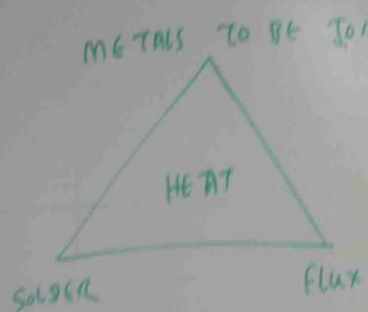
WETTING

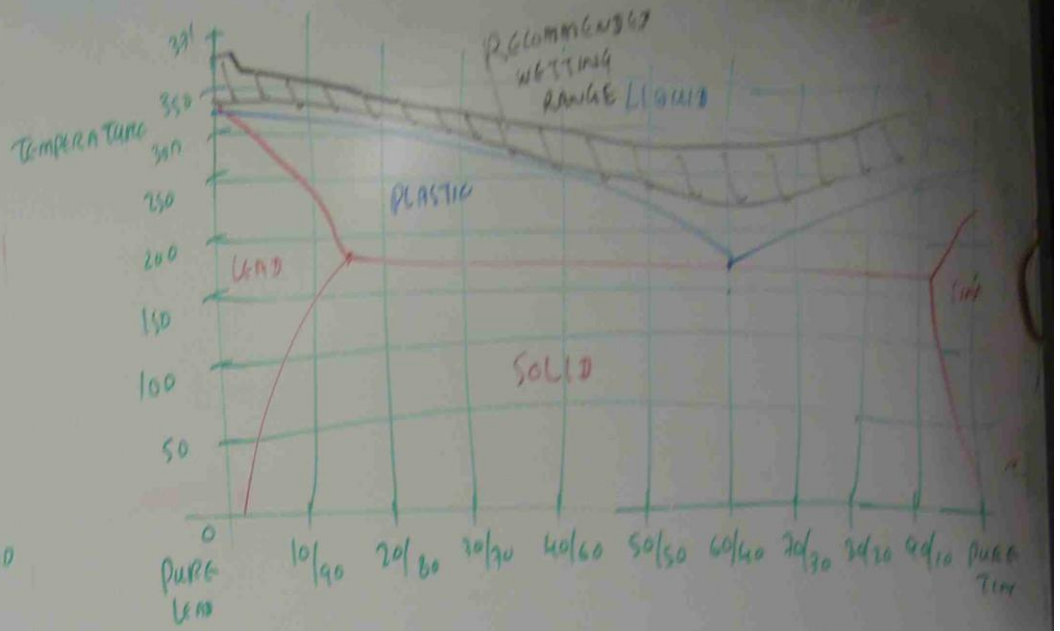
WETTING IS THE PROCESS THAT OCCURS WHEN THE COMPONENTS ARE SOLDERED TOGETHER.

WHEN THE MOLTEN SOLDER COMES IN CONTACT WITH THE COPPER TRACK, SOME OF THE COPPER DISSOLVES AND MIXES WITH THE SOLDER TO FORM A NEW ALLOY.

THE MIXING OF COPPER AND SOLDER IS CALLED A METAL SOLVENT ACTION AND IT IS SOLVENT ACTION THAT IS CALLED WETTING.

FOR THE WETTING TO OCCUR, IT IS IMPORTANT FOR THE SURFACE TO BE SOLDERED TO BE CLEAN.





SOLDER

ALLOY

MIXTURE OF 60% TIN + 40% LEAD

60/40 SOLDER

CHARACTERISTICS OF SOLDER

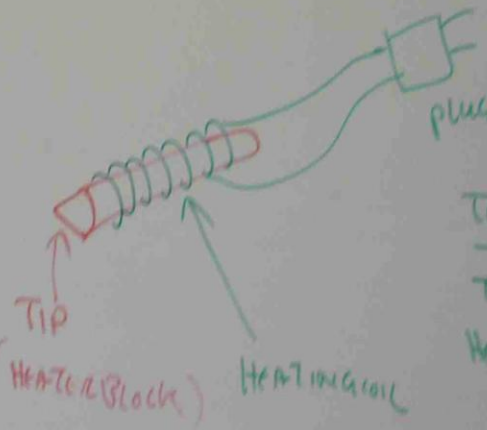
PURE LEAD - MELTING POINT 327 C

PURE TIN - MELTING POINT 232 C

60/40 SOLDER MELTS AT 191 C

FLUX

A SUBSTANCE MADE FROM ROSIN TO ADD TO SOLDER



16 → 25 W

TEMPERATURE CONTROL

TEMPERATURE SENSOR

HEATING CAUSES LOSS OF MAGNETISM

CUT OFF POWER

MAINTENANCE

KEEP THE TIP WETTED WITH SOLDER WHEN NOT IN USE

DO NOT LEAVE THE TIP AT HIGH TEMPERATURE WHEN NOT

JOINING METAL COMPONENTS

- EPOXY — GIVE MECHANICAL STRENGTH
  DOES NOT PROVIDE GOOD ELECTRICAL CONNECTION
  - DIFFICULT TO REMOVE

WELDING - EXPENSIVE
DIFFICULT TO REMOVE
GOOD MECHANICAL ELECTRICAL CONNECTION

MECHANICAL FASTENING — AFFECTED BY VIBRATION

SOFT SOLDERING

SOFT SOLDERING PROVIDES GOOD ELECTRICAL AND MECHANICAL CONNECTION. IT IS EASY TO REWORK AND PROTECTION FROM CORRISION

SOLDERING PROCESS

SOLDERING IS THE PROCESS BY WHICH TWO METALS CAN BE JOINED TO FORM A SOLID CONNECTION.

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THE JOINT IS SMOOTH AND SHINING

THERE ARE NO VOIDS OR CRACKS IN THE JOINTS

INSPECTION

DRY JOINT, DISTURBED JOINT, OVER HEATED JOINT, COLD JOINT INSUFFICIENT SOLDER, EXCESS SOLDER.

WIRE

STRIPPING

TINNING

STRIPPING IS USUALLY ACHIEVED BY CUTTING THROUGH AND REMOVING INSULATION WITH WIRE STRIPPER.

SOLDER JOINT

MAKING - PREPARATION OF THE MATERIALS TO BE JOINED

APPLICATION OF FLUX

HEAT AND SOLDER ARE APPLIED

THE JOINT IS ALLOWED TO COOL

RESIDUE FLUX IS REMOVED.

PREPARE - FREE FROM CONTAMINANTS

MAKING JOINT - SMALL AMOUNT OF SOLDER IS APPLIED

TIP OF IRON IS CLEAN

CHARACTERISTICS OF JOINT

- WETTING OF THE JOINT HAS OCCURED ON ALL SURFACES TO BE JOINED.
- THE SIDES (OR) FILLETS OF JOINT ARE CONCAVE IN SHAPE.

THE JOINT IS SMOOTH AND SHINING

THERE ARE NO VOIDS OR CRACKS IN THE JOINTS

INSPECTION

DRY JOINT, DISTURBED JOINT, OVER HEATED JOINT, COLD JOINT INSUFFICIENT SOLDER, EXCESS SOLDER.

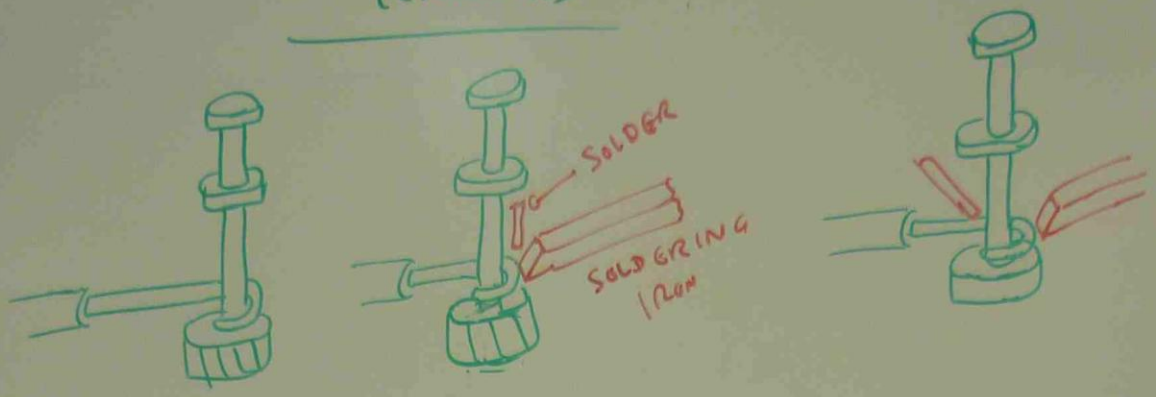
WIRE

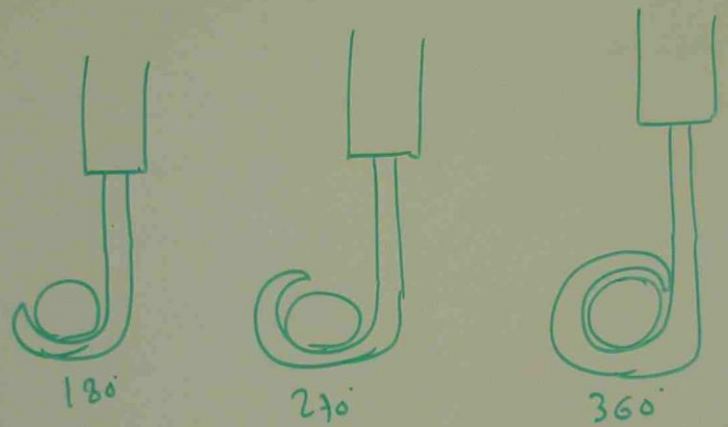
STRIPPING

TINNING

STRIPPING IS USUALLY ACHIEVED BY CUTTING THROUGH AND REMOVING INSULATION WITH WIRE STRIPPER.

TERMINALS





CORRECT WRAP

INSULATION CLEARANCE

JOINT CHARACTERISTICS

GOOD WETTING

CORRECT AMOUNT OF SOLDER

CRRECT PROFILE.