



FENCING

PART OF THE OTTER GROUP

## CHAIN-LINK SECURITY FENCING INSTALLATION INSTRUCTIONS

The following instructions outlined in this document conform to Australian Standard™ Chain-link fabric security fences and gates (1725-2003).

### Check the following before starting:

<b>Underground services</b>	<input checked="" type="checkbox"/> It is the client's responsibility to contact the necessary authorities for services such as electrical, gas, water, telecommunications etc. and then clearly mark out locations of services on ground with pressure pack spray paint. <input checked="" type="checkbox"/> To ensure a safe work procedure, it is essential that all services have been clearly identified, prior to the commencement of work
<b>Boundaries</b>	<input checked="" type="checkbox"/> It is the client's responsibility to have the property title boundaries surveyed to ensure all boundaries are correct. Or internal non title fence alignments to be established and pegged by the client.
<b>Council requirements</b>	<input checked="" type="checkbox"/> Clients responsibility to check with local council to ensure that the height and fence type proposed complies within their requirements and also obtain all necessary permits <input checked="" type="checkbox"/> NB: Front boundary alignments generally require a council building permit.

### Tools generally required for in ground post installation:

- Push/Pull Measuring Tape
- Long Measuring Tape
- Spirit level
- Wheel barrow Pneumatic Tyre
- Spinning Jenny for Cable
- Generator
- Portable welder
- String line
- Crow bar
- Hand or Mechanical Auger for drilling post holes
- Straining Bar with Hooks
- Wire strainer
- Lacing Needles
- Hammer
- Post hole shovel
- Ratchet Spanners
- Ring Spanners
- Knuckling tool
- Battery Operated Drill
- Trowel
- Pliers/wire cutters
- Sledge hammer
- Marking pen/crayon
- Metal cutting saw, or
- Angle Grinder, or
- Demolition Saw
- Ear protection
- Protective Goggles
- Leather Gloves

**NB: the Installer should carefully liaise with client prior to the commencement of work to check that all contract requirements including, fence type, specifications, site plans and all parameters of site conditions have been confirmed.**

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## STAGE 1: Installation of posts

<b>Preparation</b>	<ul style="list-style-type: none"><li>▪ Carefully mark off posts by measuring down from the top of the post for the height of your chain-link fabric, set out for cables and barbed wire if required. (NB: it may also be necessary to allow for a gap under the fence, normally with fences with a bottom rail).</li><li>▪ This allows you to have a ground level mark. If there is a top rail or top and bottom rail, allow to mark out for the size of these pipes again carefully gauge down from top of posts.</li><li>▪ Ensure all exposed top posts are fitted with galvanized press on post caps.</li><li>▪ Carefully provide 1000mm offset pegs in 2 directions to all survey pegs or proposed fence alignment for future reference and to ensure final confirmation of correct fence alignment has been achieved.</li><li>▪ Set your string line to centre of peg ensuring you allow to align face of posts to the string line, the centre of post holes are set back behind line to suit pipe diameter to establish centre of posts for post holes.</li><li>▪ Carefully and evenly space out posts to each boundary section not exceeding 3.333m centres as per AS 1725-2003.</li><li>▪ Carefully establish location for gate openings, NB: post holes for gateway shall need to allow for proposed opening width of gate, plus gate post diameter to establish centre of post holes, EG for 1000mm opening Gate allow for outside diameter of proposed gate posts normally 60.3mm o/d , therefore post hole centres are 1060mm</li></ul>
<b>End, corner &amp; gate posts</b>	<ul style="list-style-type: none"><li>▪ Excavate the post holes for all of your end and corner posts at a minimum depth of 750mm x 250mm diameter ensuring the hole is centred to allow the posts to be set with face of the posts to centre line of survey peg.</li><li>▪ Carefully check AS 1725-2003 for post hole specifications for Gates as footing size depends on proposed gate width and post size.</li><li>▪ Excavate all intermediate post holes 600mm depth x 250mm diameter, which conforms with AS 1725-2003</li><li>▪ Please ensure that hand dug holes are not wedge shaped.</li><li>▪ Provide for pre-mix concrete at 20MPA strength or carefully hand mix in a barrow for portability.</li><li>▪ Ensure the ground level mark on the post is level with the ground or designated finished levels, if not, adjust the hole depth to suit.</li><li>▪ Stand the post in the hole and plumb the post with your spirit level against the string line.</li><li>▪ Carefully insert the concrete in the hole around the post and for a professional finish, later trowel the concrete at the top of the footing as close to natural ground level as possible to allow for water run off.</li><li>▪ Double check that the Gate, Corner or End posts remains plumb both ways and set true to required height and correct alignment. Carefully re-check gate openings are correct</li><li>▪ <b>HANDY HINT</b> - Always measure gate width close to finished ground levels with tape set to level line. Do not measure opening on grade or slope.</li></ul>

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## STAGE 1: continued...

<b>Intermediate posts</b>	<ul style="list-style-type: none"><li>▪ Carefully and evenly bone the intermediate posts between terminal posts, always considering the proposed finished levels required by client, by sighting posts along a pre determined height mark on a post, such as a cable mark position. The fence heights can then gently and smoothly flow over undulations if deemed necessary between terminal posts by sighting, always maintaining a straight alignment to string line.</li><li>▪ Ensure the ground level mark on the post is set close with the ground or predetermined levels, if not, adjust the hole depth to suit.</li><li>▪ Stand the post in the hole and plumb the post with your spirit level against the string line.</li><li>▪ Provide for Pre-mix concrete at 20MPA strength or carefully hand mix in a barrow for portability</li><li>▪ Carefully insert the concrete in the hole around the post and for a professional finish, later trowel the concrete at the top of the footing as close to natural ground level as possible to allow for water run off.</li><li>▪ Carefully double check that all the posts are plumb and remain true to the alignment before concrete cures.</li></ul>
<b>Stays for Rail-Less (3 Cable Fencing)</b>	<ul style="list-style-type: none"><li>▪ Alternative approved methods of providing bracing stays to terminal posts are included with AS 1725-2003. Pipe stays are generally DN32 (42.4mm OD) pipe.</li><li>▪ Clamp the stay rail and fittings onto your end, corner and gate posts at approximately 300mm below the finished height of the chain-link fabric.</li><li>▪ <b>Option (A) Horizontal Rail with 2 fittings and Turnbuckle &amp; Diagonal Cable wires;</b> always secure turnbuckle to base of terminal post with double strand 3.15 wire tie, then attach diagonal twin cable secured from turnbuckle eye up to and around rail fitting at intermediate post, then tension turnbuckle and twin cable to ensure the terminal posts remains plumb under load from strain of the fence.</li><li>▪ <b>Option (B) Diagonal Pipe Stay (with lower end set into concrete footing);</b> Top end of diagonal stay shall be clamped to terminal post set 300mm below finished height of chain-link fabric, the pipe stay then runs diagonally set close inside the face of the chain-link fabric with the base bent to enter the ground vertically and set into a concrete footing as for an intermediate post. This stay footing shall be set back from terminal post at a distance not less than the specified chain-link height of your proposed fence.</li><li>▪ <b>Option (C) Diagonal Pipe Stay (with pipe stay clamped at both ends);</b> Top end of diagonal stay shall be clamped to terminal post set 300mm below finished height of chain-link fabric, the pipe stay then runs diagonally to the base of the first Intermediate post and the secured with a suitable clamp on fitting.</li></ul>

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### STAGE 1: continued...

<b>Top Pipe Rails (When Specified generally DN32)</b>	<ul style="list-style-type: none"><li>Top pipe rails are specifically located and clamped to posts to suit the top selvage alignment of chain-link fabric, (Knuckled selvage is located to the under side of the top rail) and (Barbed top selvage generally has first half diamond centred on face of rail with barbed twist ends protruding above the top of the top rail) Refer to diagrams in AS 1725-2003.</li><li>Top rail for Plain top fences shall generally have top rails clamped to tops of posts forming a running top rail.</li><li>Top rail for 3 Barb extension post fences shall have rails cut and clamped between posts set to position to suit both mesh height and selvage type.</li><li>Chain-link shall be laced through each diamond to top rail with 2.00mm lacing wire with matching type of wire as per chain-link fabric.</li><li>Refer to AS 1725-2003 for alternative approved methods of joining lengths of top rails.</li></ul>
<b>Bottom rails (If applicable)</b>	<ul style="list-style-type: none"><li>Measures the inside distance between each set of posts and deduct 30mm. o/all (15mm clearance for each bolt )</li><li>Mark the measurement on the rail and cut with a metal cut off saw.</li><li>Bolt rails to posts using clamp-on galvanized fittings and set to a pre-determined level mark scribed on posts. Always locate nuts on fittings to inside of property.</li><li>Chain-link fabric shall be laced through each diamond to bottom rail with 2.00mm lacing wire with matching type of wire as per chain-link fabric.</li></ul>

### STAGE 2: Installation of Cable Wire

<b>Helicoil Cable Wires</b>	<ul style="list-style-type: none"><li>Neatly tie off cable wire at a end, corner or gate post, at a pre-determined mark for cable wire scribed on posts, allow to fold twice around the starting post then 4 complete tight twists over and around the running cable wire, ensure the cable is located on the outer face side of the posts, then carefully strain with wire strainers between 1.00 to 1.20KN to your next end, corner or gate post, (Do not overstrain) then tie off as per starting post.</li><li>Repeat the process for each section of fencing between terminal posts and for each required numbers of cable wires specified for that design of fencing.</li><li>At all intermediate posts lift cable to the pre-determined mark for cable then apply a double crossover 2.00mm wire tie neatly twisted tight behind post. To hold cable firmly in position.</li><li>Repeat this process for all other cable wires you require.</li><li><b>Warning:</b> Excessive strain with wire strainers on cable wires may cause the terminal posts to pull over out of plumb.</li></ul>
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### STAGE 3: Installation of Chain-link Fabric

<b>Rolling out Chain-link Fabric</b>	<ul style="list-style-type: none"><li>Stand upright the first roll of chain-link at the beginning of the fence line.</li><li>Using the tie wire, either tie at least 5 times or lace the end of the chain-link fabric to the first post.</li><li>Roll out the chain-link fabric keeping it in an upright position and put a temporary tie from the top of the chain-link to the top cable wire or top rail. Ensure this tie is loose so it will allow the chain-link fabric to move along the fence line like a curtain when straining.</li><li>When you come to the end of a chain-link roll there will be a loose spiral left. Use this spare spiral for joining the next roll. This can be achieved by standing the next chain-link roll at the end of the attached chain-link and weaving the two together using the spare spiral.</li><li>Continue rolling out the chain-link fabric until you get to the end of the fence line.</li><li>When you are at the end, take a spiral out of the chain-link fabric eliminating any excess and leaving 300mm overhang.</li></ul>
<b>Straining Chain-link Fabric</b>	<ul style="list-style-type: none"><li>At the beginning of the fence line, go to the second post and pull the chain-link fabric along until there is a good tension then strain with a pipe bow levered against intermediate post.</li><li>To hold the chain-link fabric in place, secure two ties down the post at midway between cables to hold strain on fabric.</li><li>Continue this procedure down the fence line.</li><li>At the end, tie at least 5 times or lace the end post if applicable.</li><li>Optionally the chain-link fabric may be rolled out flat on the ground only where room permits, allow to continually pull up any slack from the fabric along the ground at each roll length whilst flat on the ground, and continue the process until you have reached the end section of fencing, then go back to the beginning whilst pushing up the chain-link fabric against the posts and cable wires, insert a small pipe bow into the chain-link fabric to lever and strain the panel of fabric to obtain sufficient tension on fabric at each intermediate post, whilst maintaining strain, provide 2 ties to each intermediate post, continue the process to the end of each section.</li></ul> <p><b>HANDY HINT</b> - For optimum results you can strain the chain-link fabric in longer sections with a full height straining bar set with hooks in conjunction with wire strainers to achieve an optimum strain of 1.0 to 1.2KN on chain-link fabric.</p>
<b>Securing of chain-link or tying to cable wires</b>  <b>Or Lacing to rails</b>	<ul style="list-style-type: none"><li>Clip off chain-link fabric onto all cable wires using either 2.24mm x 19mm netting clips to every fourth diamond. OR</li><li>Optionally tie the chain-link fabric every sixth diamond with 1.57mm tie wire.</li><li>Install minimum of 2 no 2.00mm ties to intermediate posts centred between cables</li><li>Lace chain-link fabric with 2.00mm lacing wire (fitted to a lacing needle) after straining, Lace fabric through each diamond to all internal corners, ends &amp; gate posts. Or securely lace to Top &amp; Bottom Rails where installed, through each diamond</li></ul>

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## STAGE 4: Installation of barbed wire if required

<b>Attaching barbed wire to post extensions</b>	<ul style="list-style-type: none"><li>Barbed wire shall be strained taut between 1.0 to 1.2 KN on face of posts and secured with tie wires to pre punched holes at preset 150mm equal spacings above chain-link fabric.</li></ul>
<b>Fixing and Straining the Barbed Wire</b>	<ul style="list-style-type: none"><li>Attach the barbed wire to the starting terminal post, positioned at one of the pre punched holes on the post extension and secured with a 2.00mm tie wire to prevent slippage down the post, then wrap the free end of the barb around the starting post with a large loose loop and cross over and twist to the line wire, Proceed to roll out the barbed wire to next terminal. Then using a wire strainer, strain the barbed wire until tensioned and then tie of again at finishing terminal post with a large loose loop, The final stage then is to tightly twist the loops at either end for final tensioning, to achieve 1.0 to 1.2KN strain then neatly trim off the end tails.</li><li>Repeat the process to each fence section for all 3 rows of barbed wire.</li><li><b>HANDY HINT:</b> set up the spool of barbed wire with a small securely fixed frame with a pipe axle located through the wooden spool, to make it easier to pull out the barbed wire, always use leather gloves and safety glasses when installing barbed wire.</li></ul>

## STAGE 5: Installation of Chain-link Gates

<b>Hanging gates</b>	<ul style="list-style-type: none"><li>Using suitable size blocks for the gap under the gates, place them in a position where the gate will stand in a reasonably level position and the top of the gate is level or marginally higher with the gate posts. Then fit a loose temporary tie wire to gate post for safety purposes to prevent gate falling.</li><li>Attach the hinges ensuring the bottom hinge is under but hard up against the hinge collar of the gate. Carefully bump the gate down to required height then Tighten nuts and bolts.(Nuts Inside)</li><li>Adjust gates if necessary to ensure they meet evenly at centre and match fence height check operation of fittings, then check the gates can open and close without encountering obstructions</li><li>Finally drill into the concrete for the drop bolt if the gates are double leaf or if there is no concrete pavement, dig a hole and insert a pipe gate stop (ferrule) into a concrete pad and install ferrules in both open and closed positions.</li></ul>
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