



Layher Allround Scaffolding®
Instructions for Assembly and Use
Australia

The universal system
for day-to-day and
ambitious scaffolding jobs

Quality management
certified according to
ISO 9001:2008
by TÜV-CERT

Allround Scaffolding



Layher®

More Possibilities. The Scaffolding System.

▶ CONTENTS

| | | | | | |
|-----|------------------------------------|----|-----|---|----|
| 1. | Introduction | 4 | 17. | Bridging with lattice beams | 37 |
| 2. | Measures to prevent falls | 7 | 18. | Mesh guard | 38 |
| 3. | General | 10 | 19. | Ground adjustment..... | 39 |
| 4. | Basic components | 12 | 20. | Changes in standard configuration | 40 |
| 5. | Façade scaffolding..... | 16 | 21. | Use of the scaffolding | 40 |
| 6. | Tower scaffolding | 18 | 22. | Dismantling the scaffolding | 41 |
| 7. | Birdcage scaffolding..... | 20 | 23. | Components..... | 42 |
| 8. | Support scaffolding | 20 | | | |
| 9. | Circular scaffolding..... | 21 | | | |
| 10. | Suspended scaffolding | 23 | | | |
| 11. | Mobile scaffolding units..... | 25 | | | |
| 12. | Anchoring..... | 26 | | | |
| 13. | Accesses | 29 | | | |
| 14. | Deck cutouts and deck inserts..... | 33 | | | |
| 15. | Corner solutions..... | 34 | | | |
| 16. | Brackets & cantilevers..... | 35 | | | |

LOCAL REGULATIONS

The products or assembly variants shown in these instructions for assembly and use may be subject to local regulations.

The product user bears the responsibility for compliance with such regulations.

Subject to local regulations, we reserve the right not to supply all products illustrated here.

Your local Layher partner will be happy to provide advice and answers to all questions relating to the product approval, to their use or to specific assembly regulations.

▶ 1. INTRODUCTION

General

These instructions for assembly and use relate to assembly, modification and dismantling of a few representative applications of the Allround scaffolding from Wilhelm Layher GmbH & Co. KG, of Gueglingen-Eibensbach, Germany. The instructions give general information and cannot cover all the possible applications. If a construction deviates from these Instructions for assembly and use or other national health and safety requirements the scaffolding constructor has to develop suitable instructions relating to the stability of the scaffolding and to health and safety as part of the scaffolding erector's risk management process. The scaffolding contractor must ensure that all reasonably foreseeable hazards to health and safety associated with the erection, use or dismantling are identified before and during installation/dismantling of the scaffolding. Any hazard identified must be assured in terms of risk and must be controlled by the scaffolding contractor. These instructions do not dispense with the scaffolding contractor's obligation to perform his or her own risk assessment for any particular site or work method. If you have any questions about specific applications, please contact your Layher partner.

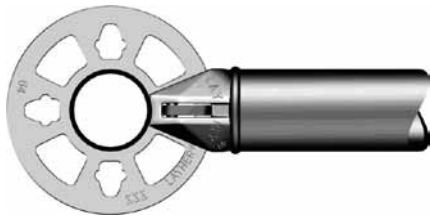


Fig. 1: Layher Allround steel acc. to Z-8.22-64



Fig. 2

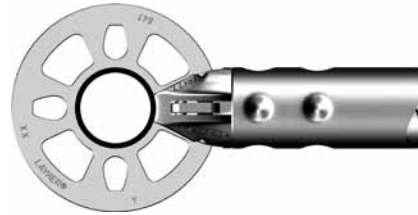


Fig. 3: Layher Allround aluminium acc. to Z-8.22-64.1



Fig. 4

Caution: The stability of the scaffolding must be verified and assured at all times, including the assembly, modification and dismantling state. Layher Allround scaffolding may only be assembled, modified and dismantled under the supervision of a qualified expert and by technically trained employees.

During assembly, only original Layher scaffolding components identified with the conformity mark <Ü> and the appropriate German approval number (Z-8.22-64 for steel and Z-8.22-64.1 for aluminium) may be used.

Visually check all scaffolding components prior to installation and before they are used to ensure that they are in flawless condition. Do not use damaged components.

Caution: Assembly, alteration and dismantling of the Layher Allround scaffolding involves a risk of falls. Perform scaffolding assembly work in such a way that the risk of falls is avoided as far as possible and that the residual risk is minimized. Assembly situations where there is a risk of falls are indicated in these instructions with the following symbol inside the assembly pictures.



Fig. 5

The scaffolding erector must stipulate, on the basis of how he assesses the risk, suitable measures to prevent or minimize risks for the actual case and/or the respective activities involved.

The measures must be selected with due consideration of the actual risk, their usefulness and their practical possibilities, and also depending on

- the qualification of the employees,
- the type and duration of the activity in the high-risk area,
- the possible fall height,
- the state of the surface onto which the employee might fall,
- the state of the workplace and its access and
- the local regulations.

Technical and personnel-related measures can be applied during assembly, modification and dismantling. Possible measures can include, depending on the assembly situation, the use of qualified personnel specifically informed of the respective risk situation, the use of the advance guardrail, or the use of suitable personal safety apparatus. In any event, the assembly sequence must be designed such that side protection is installed at once, so that personnel work predominantly in secured areas.

If the use of fall-arrest systems or of an advance guardrail is required or is specified by local regulations when Layher Allround scaffolding is being assembled, the attachment points shown in section 2 or the advance guardrail as shown must be used. The suitability of fall-arrest systems for fall prevention must be checked, with particular attention being given here to the assembly of the second and third scaffolding levels.

Before the start of scaffolding work, the contractor must ascertain whether the planned working area contains equipment that might endanger the employees. Assembly, modification and dismantling may only be performed with appropriate protective equipment. Scaffolding components must not be thrown; instead they must be handed over in such a way that they cannot slip or fall down.

After completion of the assembly work and before every use of the scaffolding, a check must be conducted to ensure it is in good condition. With regard to the following instructions for assembly and use of the Allround scaffolding system, it must be pointed out that as a general principle scaffolding may only be assembled, modified or dismantled under the supervision of a qualified person and by technically trained employees adequately and specifically instructed in this work. To that extent, and with regard to use, we refer to the required conditions set forth in Australian Occupational Health and Safety Regulations (OH&S). In the following instructions for assembly and use, we provide the erector and the user, on the basis of our risk analysis, with advice on how to comply with the requirements of OH&S in the respective assembly situation.

The technical details set forth in the instructions for assembly and use are intended to help the erector and/or user to comply with the requirements of OH&S and are not mandatory specifications for them. The erector/user must take the measures needed on the basis of a risk assessment to be prepared according to the preconditions of OH&S at their own discretion, exercising all due care and diligence. The specific features of the individual case must be taken into account here.

It is essential that the following instructions for assembly and use are complied with in every case. It is pointed out that all information, particularly that regarding stability in the assembly variants, applies only when original Layher components identified with the approval numbers stated on page 4 are used. The installation of non-Layher parts can lead to safety defects and insufficient stability.

The present instructions for assembly and use must be available to the supervisor and to the employees involved.

During assembly, modification and dismantling, as well as during use of the scaffolding, the national regulations for scaffolding design and health and safety concerning the erection and use of scaffolding must be complied with.

Inspection and Documentation

The scaffolding supervisor and inspector must ensure that the scaffold has been checked prior to use by a qualified person (a scaffolder with a national licence to perform high risk work - Scaffolding.) Depending on the design of the scaffold the qualification can be Basic, Intermediate or Advanced. The documentation should be visible from all access points of the scaffold. Any area of the structure that is incomplete or has specific use restrictions must be blocked off and clearly identified.

After completion of the scaffolding, it is useful to indicate that inspection has been passed by a clearly discernible identification on the scaffolding itself for the duration of its use. This identification should include the following information:

Identification examples:

- Compliance with AS/NZS 1576 & AS/NZS 4576
- Name of scaffolding company
- Name of scaffolding supervisor/inspector
- Contact phone number
- Scaffold description
- Permissible load
- Date of erection
- Date of subsequent inspections



Fig. 6



Fig. 7

Subsequent weekly inspections are required when the scaffolding is 'in-service', monthly inspections when 'out-of-service'. Inspections are also required after any modifications to the scaffold or after a significant weather event.

Use

Every employer who requires personnel to use the scaffolding or parts of it must comply with Australian OH&S Regulations. The inspection is intended for confirmation of safe operation depending on the respective use of the scaffolding. After any unusual events that might have damaging effects on the safety of the scaffolding, person responsible must immediately ensure that an unscheduled inspection is performed by a qualified person and ensure that the scaffolding is checked for obvious defects before use. If defects are found during this check, the scaffolding must not be used in those areas where there are defects until these have been eliminated by the scaffolding erector. Subsequent alterations to the scaffolding are deemed as assembly, modification or dismantling and may only be performed by technically trained employees. If the scaffolding is used by several employers, simultaneously or successively, each employer must ensure that the above inspection is conducted.

Allround scaffolding has been approved or certified in many European countries according to European Standards EN12811 parts 1-3 and EN12810 part 1 and 2. In the UK these European Standards also apply, consequently Allround scaffolding complies with scaffolding standards in the UK. Allround scaffolding has also been approved or certified in many countries outside of the European Union and complies with Australian Standards.

Caution: Differing and supplementary local regulations are not taken into account in these instructions, but must be complied with.

A detailed list of articles can be found in our catalogue, and information on structural values in our technical documents.

Layher Allround scaffolding may be used as work scaffolding and protective scaffolding according to the stated load classes, and in compliance with the present instructions for assembly and use and with the stipulations of Australian OH&S Regulations.

Important assembly instructions

Work on the scaffolding must always be performed wherever possible on a completely assembled and secured level.

WARNING

Wedges must be hammered home immediately after assembly of the components using a 500 g metal hammer until the blow bounces off.

The wedge couplers must be hammered tight using a 500 g metal hammer until the blow bounces off. Screw couplers must be tightened with an at least 50 Nm torque.

Scaffolding may only be erected on sufficiently strong surfaces. Before assembling Layher Allround structures, the surface must be checked for sufficient load-bearing capacity. Suitable load-distributing bases must be selected.

The maximum spindle extension lengths must not be exceeded. One-sided positioning of the base plate can cause excessive stresses in its cross-section and collapse of the scaffolding.

The stability of the scaffolding must be verified and assured at any time, including all assembly status.

Anchoring must be installed continually as scaffolding assembly progresses. If necessary, stability must be assured by ballasting or bracing.

All decks installed as part of a working platform must have lift-off preventer fitted.

No personnel or loose objects may be on rolling towers when these are being moved. The wheels of the mobile tower must always be locked and may be released only when the tower is being moved.

► 4. BASIC COMPONENTS OF LAYHER ALLROUND SCAFFOLDING

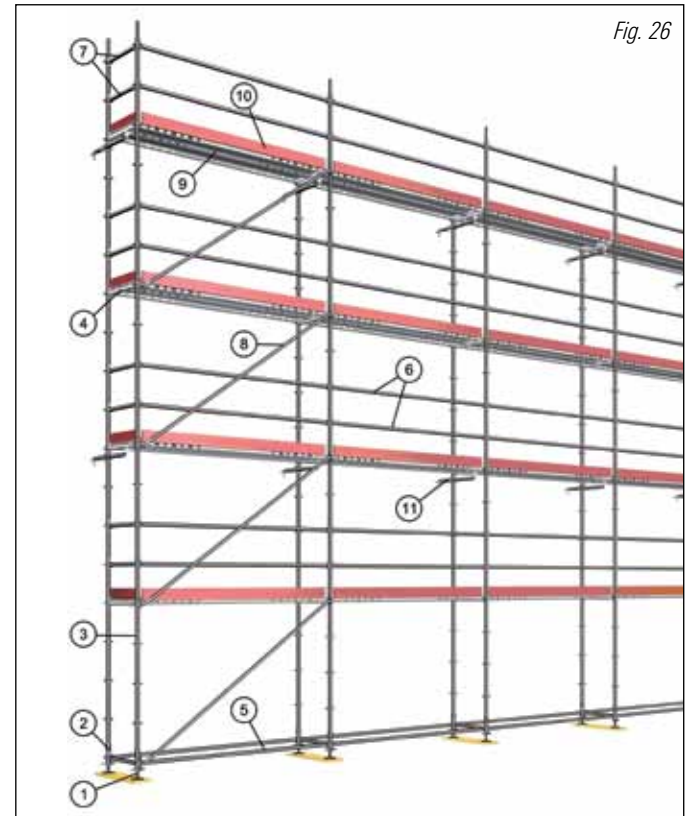


Fig. 26

- 1 Adjustable base plate
- 2 Base collar
- 3 Standard
- 4 Support ledger (U-ledger or O-ledger)
- 5 O-Ledger
- 6 Guardrail (O-ledger)
- 7 End guardrail (O-ledger)
- 8 Diagonal brace
- 9 O-/U-Scaffolding deck
- 10 Toe board
- 11 Anchoring

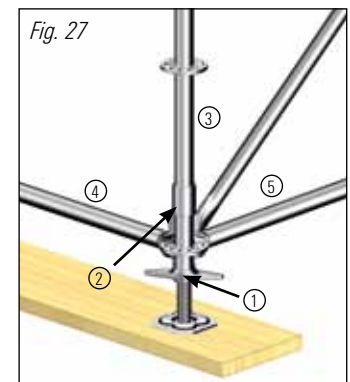


Fig. 27

Base jacks

The base jacks must be in full surface contact. All base jack types must be secured against slipping and sliding.

Adjustable base jack type and extension length

Adjustable base jacks with the biggest maximum spindle adjustment may be used provided their load-bearing capacity is ensured in each case. If the surface is not level, swivelling base jacks or wedge-type inserts must be used and secured against sliding.

Load capabilities of base jack cross-section as per DIN EN 12811-1

| Base jack type | N _{pl,d} [kN] | M _{pl,d} [kNcm] | V _{pl,d} [kN] |
|----------------|------------------------|--------------------------|------------------------|
| normal | 97.7 | 83.0 | 36.0 |
| reinforced | 119.9 | 94.5 | 44.1 |
| solid | 288.0 | 157.0 | 106.0 |

Base collars

The base collars with rosettes are fitted over the height-adjustable base jacks and are suitable for forming the base. In special cases the base collars can be dispensed with.

Standards

The Allround standards are provided with rosettes at every 50 cm. They are available in lengths of 0.5 m, 1 m, 1.5 m, 2 m, 2.5 m, 3 m and 4 m. The small openings in the rosette determine right-angled connections; the large openings permit connections at any angle.

Ledgers

Ledgers serve as bracing elements and guardrails. The wedge lock connection ensures a positive and non-positive connection with central load introduction between the standards and ledgers.

Assembly variation 1

See page 15 for explanation of the Allround Wedgehead connection.

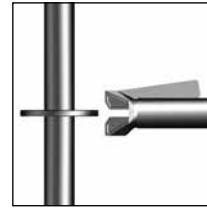


Fig. 28

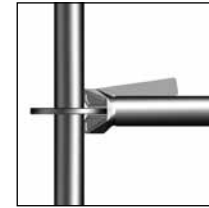


Fig. 29

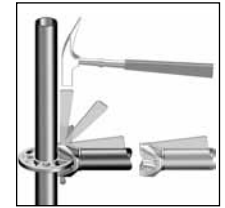


Fig. 30

Assembly variation 2

This variation provides adequate safety when using longer ledgers. The far end is laid with the wedge projecting through the rosette. This prevents slippage of the ledger. The near end is slipped onto the rosette and the wedge dropped into place. The wedge at the far end is lifted out of rosette allowing the head to be slipped onto the rosette and secured. Both wedges are hammered home.

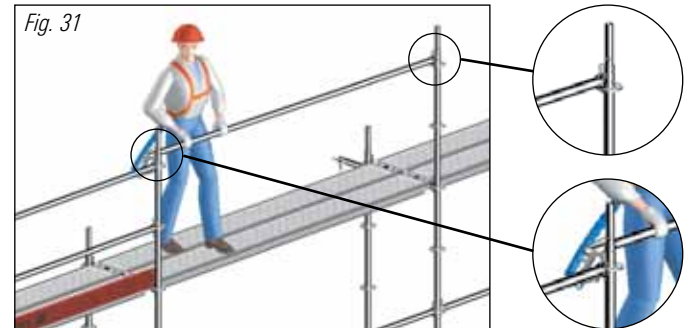


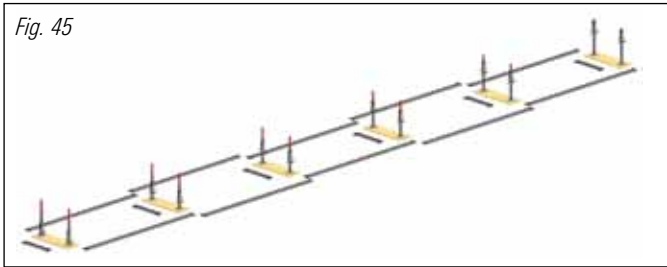
Fig. 31

► 5. FAÇADE SCAFFOLDING

Caution: Check the surface for sufficient load-bearing capacity, and lay out suitable sole plates.

The maximum adjustable base jacks extension length must not be exceeded. When positioning, the maximum wall clearance must be ensured to prevent any risk of falls at the upper levels.

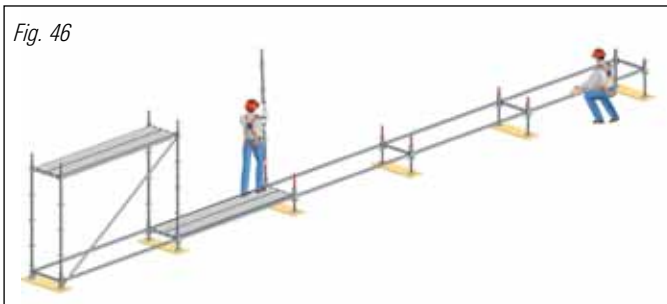
Fig. 45



1. Assembly should be started at the highest ground level (refer to section 19). In the first step, longitudinal ledgers and transoms must be laid out.
2. Place sole plates where standards are required.
3. Position adjustable base jacks with attached vertical base collars on the sole plates.
4. Connect ledgers in the small holes in the rosettes. Align the base of the scaffolding parallel to the façade and level using a spirit level.

Caution: When positioning, stay within the maximum clearance from the wall, otherwise there is a risk of falling.

Fig. 46



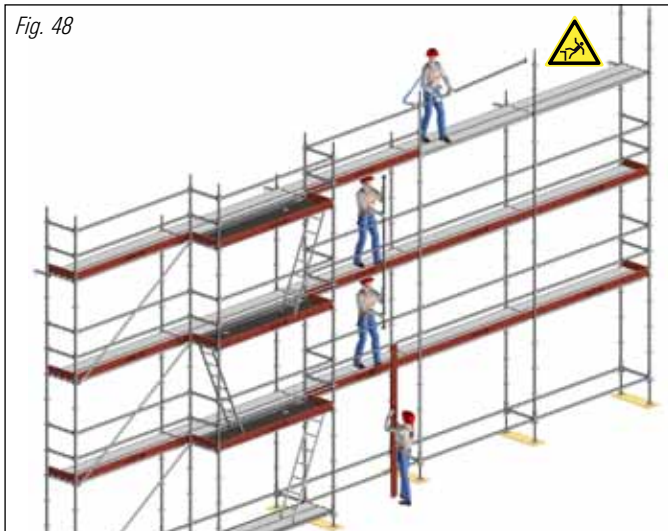
5. Then insert decks in the access bay.
6. Fit vertical standards. Install transoms.
7. Insert decks, secure them against lifting out, and stiffen the scaffolding with vertical diagonal braces. Stiffen at least every fifth bay with vertical diagonal braces. Preferably diagonal braces should be installed on the outside of the scaffolding.
8. If system decks are not used, for each 2 m lift, horizontal ledgers are required in every bay at 2 m lift heights and horizontal diagonals must be installed in vertical diagonal bay.
9. Insert the access deck and the remaining steel decks, then close the lift-off preventer. Knock in the wedges.

Fig. 47



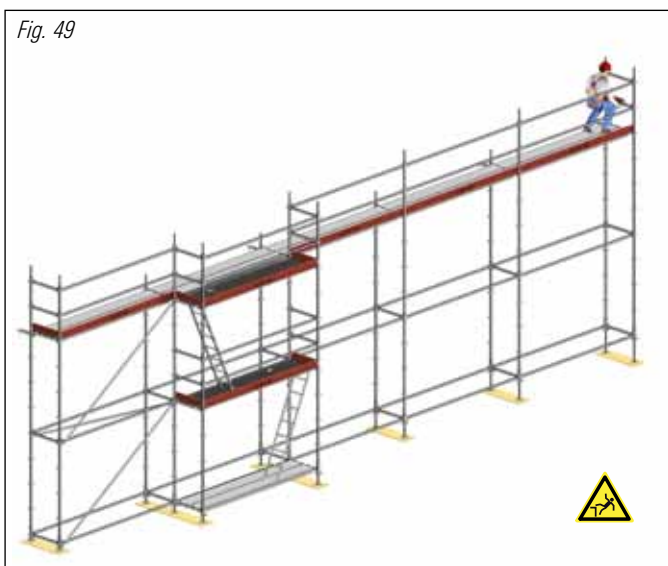
10. Fit three-piece edge protection comprising guardrail, midrail and toe board.
11. Attach vertical diagonal braces. Preferably diagonal braces should be installed on the outside of the scaffolding.
12. Fit access deck and steel decks, then close the lift-off preventer. Knock in the wedges.
13. **Caution:** Attach the necessary anchoring continually as scaffolding assembly progresses. Refer to the Anchoring section.

Fig. 48



14. **Caution:** Complete the top working level with three-piece edge protection at the edges at risk from falls.

Fig. 49



Assembly of the further scaffolding levels

Depending on the risk analysis, for scaffolding more than 8 m high (deck height above ground surface), building hoists should be used for assembly, modification and dismantling. As an exception to this, hoists can be dispensed with if the scaffolding height is no more than 14 m and the overall length of the scaffolding is no more than 10 m. For manual handling, a worker must stand at each level depending on the components being moved.

Caution: There is a risk of falls during assembly of the further scaffolding levels. Measures ascertained in the risk analysis performed by the scaffolding erector must be applied.

Caution: Keep the hatches in access decks closed at all times! Only open them when needed, and close them again immediately afterwards!

Fig. 50



▶ 7. BIRDCAGE SCAFFOLDING

Birdcage scaffolding can be used to cover ceilings, and is also used as support scaffolding. Assembly is similar to that for tower scaffolding, with particular attention being given to bracing of the scaffolding structure. Check the surface for sufficient load-bearing capacity, and lay out suitable sole plates.

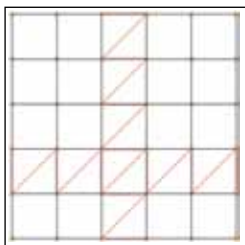
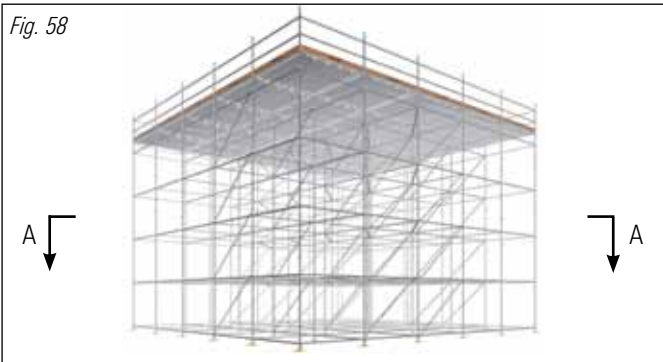
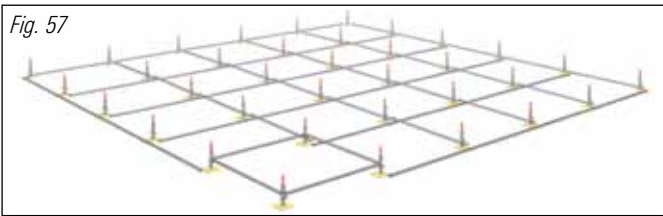


Fig. 59 Section A-A

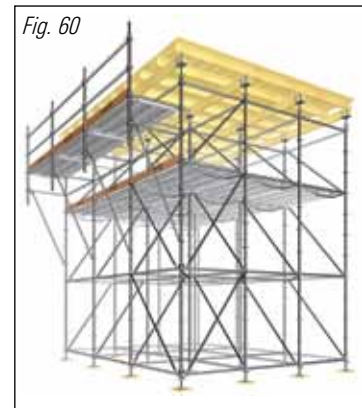
Arrange the vertical diagonal braces so that every axis of the birdcage scaffolding is stiffened by a brace in at least every fifth bay. Furthermore, use horizontal diagonal braces or, for example, decks (see section A-A) to ensure that the horizontal scaffolding levels are braced too. **Caution:** Stiffening in every fifth bay is the minimum required; resistance to greater loads requires a denser arrangement of diagonal braces. Preferably diagonal braces should be installed on the outside of the scaffold.

▶ 8. SUPPORT SCAFFOLDING

With Layher Allround equipment, support scaffolding can be put up quickly and economically for the safe transfer of loads.

Caution: Check the surface, and lay out sole plates suitable for transferring the loads.

Support scaffolding, e.g. for concreting of floors



1. Falsework, for example when concreting floors, is erected in the same way as tower and birdcage scaffolding.
2. At the top level, use vertical braces without spigots.

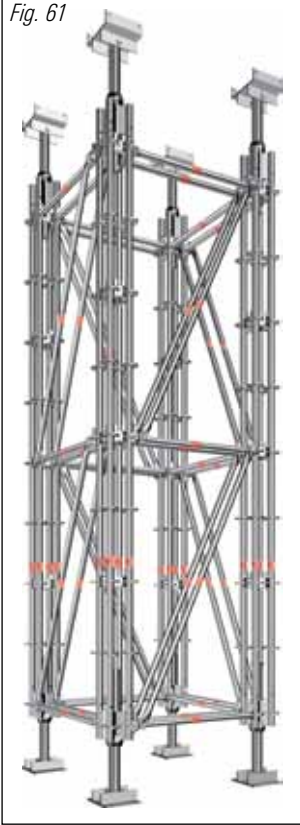
Caution: The load-bearing capacity for the transfer of loads must be verified, with particular attention to stiffening with vertical diagonal braces, the bay width and the spindle adjustment of the base jacks and head jacks. Preferably diagonal braces should be installed on the outside of the scaffold.

3. Fit head jacks onto the vertical standards.

Caution: The loads of the formwork supports must pass centrally into the head jacks. The formwork supports must be prevented from tilting.

The length of the vertical standards must be selected so that the adjustable base jacks and head jacks are extended as little as possible. If bracing of the spindles is necessary, a wedged swivel coupler with spindle insert must be used.

Fig. 61

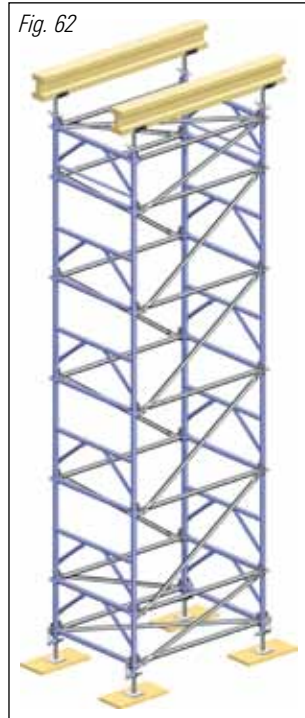


Heavy-duty tower

Heavy-duty tower for transfer of high individual loads, made from standard material using the following additional parts:

- Head jack for heavy-duty tower
- Heavy-duty 4 way head collar
- Twin wedge coupler
- Heavy-duty 4 way base collar
- Base for heavy-duty tower

Fig. 62



For efficient, quick and safe construction of support scaffolding, we recommend the Allround support scaffolding frame TG 60. See instructions for assembly and use.

► 9. CIRCULAR SCAFFOLDING

Thanks to 8 possible connections and variable angle selection, curved surfaces can be enclosed with scaffolding without any problem. The following distinction is useful here:

Small diameter = rectangular scaffolding supplemented with Layher steel planks.

Large diameter = use of variable angle selection by connection to the Allround rosette

Check the surface for sufficient load-bearing capacity and lay out suitable sole plates. These sole plates must extend over both uprights.

Enclosing structures with small diameter

Fig. 63

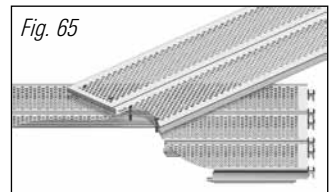


1. Lay steel planks at the inside corners.
2. The support length of the steel plank when secured by at least two locking pins should be at least 10 cm.

Fig. 64

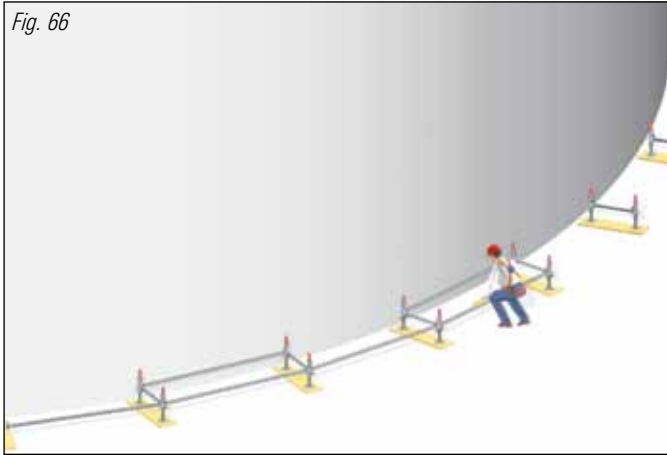


Fig. 65



Scaffolding around an oil tank with large diameter

Fig. 66



1. Lay the ledgers to match the curvature of the round tank.
2. Lay sole plates, and position base jacks with attached base collars.
3. Align the base of the scaffolding with the tank and level using a spirit level.

Caution: When positioning, stay within the maximum clearance from the wall, otherwise there is a risk of falling.

Tip: Depending on the radius, it is an advantage to insert all ledgers into the large holes (see solution 1) or only the ledgers of the intermediate bays (see solution 2).

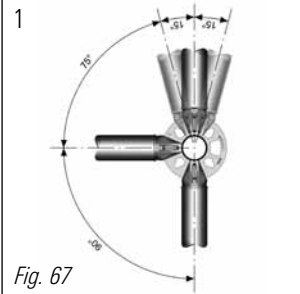


Fig. 67

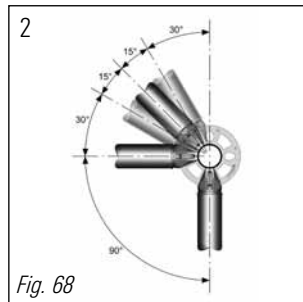
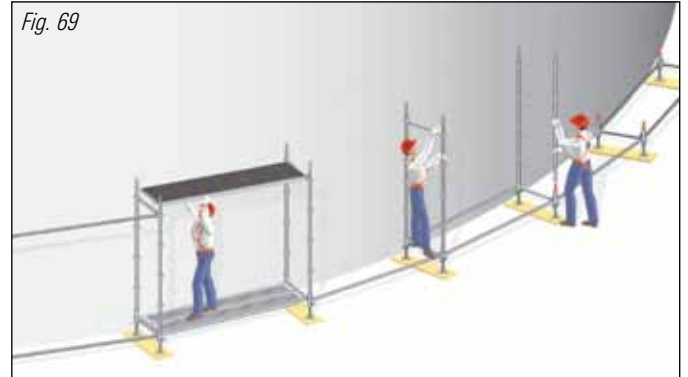


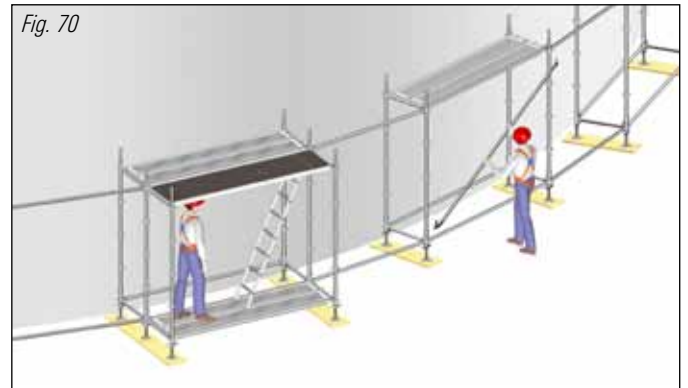
Fig. 68

Fig. 69



4. Fit vertical standards.
5. Insert decks as standing surface in the access bay.
6. Fit transoms.
7. Insert access deck.

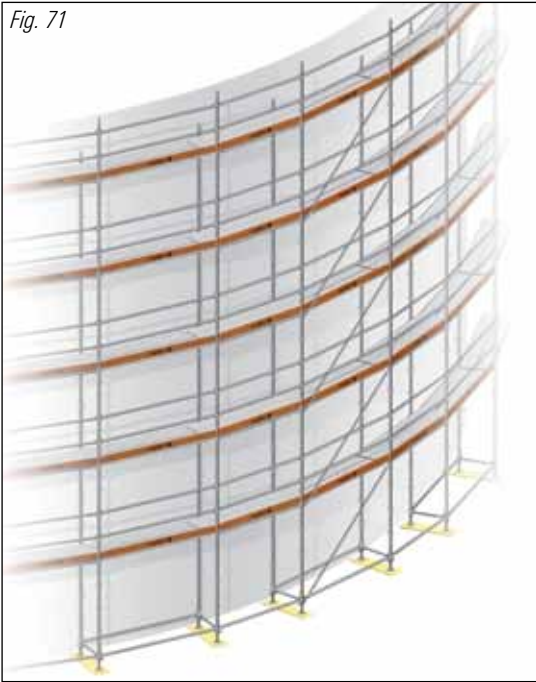
Fig. 70



8. Insert decks in rectangular main bays, close the lift-off preventer.
9. Stiffen at least every fifth bay with vertical diagonal braces. Preferably diagonal braces should be installed on the outside of the scaffold.
10. Attach ledgers for intermediate bays.
11. Knock in all wedges.

12. Lay steel planks in the intermediate bays, not exceeding their permissible span. As soon as the minimum guardrail height is not attained, a third ledger at the 1.50 m level is needed.

Fig. 71



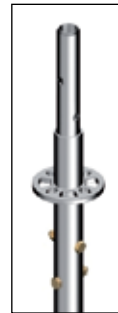
13. Repeat these assembly steps until the required height has been reached.

Caution: Anchoring must be installed continually while scaffolding assembly progresses.

▶ 10. SUSPENDED SCAFFOLDING

To minimize the amount of material used for scaffolding at great height or when the ground is not sufficiently strong and is not usable for assembly, work surfaces can be made accessible by suspended scaffolding structures. Suspended scaffolding is used in a wide variety of versions, so the following assembly sequence is intended as an example.

Suspended scaffolding can be suspended in a variety of ways. Suspension from ceilings or other structural components is possible using wall-plugs, suspended scaffolding couplers, clamping couplers, beam grippers and chains. Load capacity of the support systems must always be verified separately.



Caution: For suspended scaffolding, vertical standards with bolt-in spigots must be used for sustainable transfer of the tension forces.

The bolt-in spigots must be secured either with four M12 bolts or with hinged pins. When locking pins are used, the tensile force in the standard must be verified.

Fig. 72: Bolt-in spigot

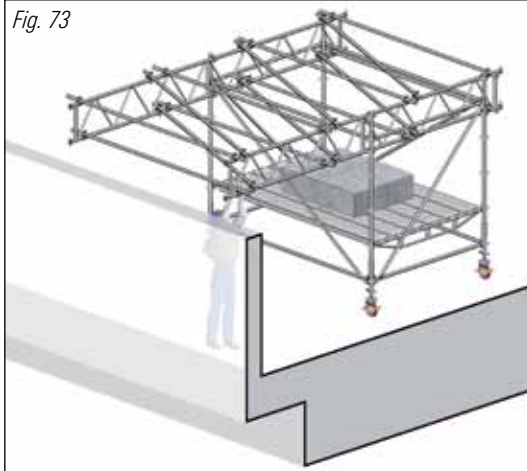


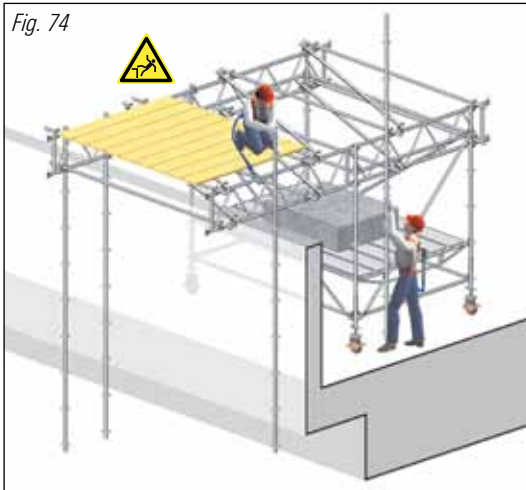
Fig. 73

1. Assemble the ballasted tower scaffolding.

The necessary ballast must be ascertained by a structural strength calculation. Safety measures must be considered in accordance with local regulations. Only solid materials may be used as ballast.

2. Connect the lattice beams to the tower scaffolding and stiffen them with tube/coupler braces at the top and bottom chords.
3. Slide the tower scaffolding up to the edge so that the ends of the lattice beams extend beyond it.

Fig. 74



4. Lay the temporary working platform, in compliance with their maximum span.

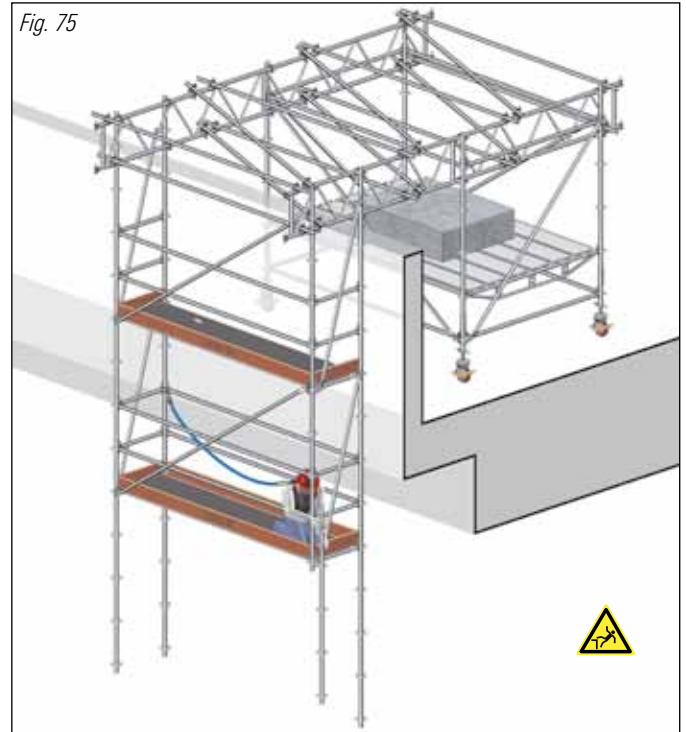
WARNING

Risk of falls. Perform these working steps only with an approved fall-arrest system, if identified by risk assessment as a suitable means of controlling the risk of fall.

5. Use a Layher double coupler to connect vertical standards to the upper and lower chords of the lattice beam at the specified distance (if necessary using a transom as an assembly aid). Secure the double couplers with check couplers.

Tip: Install the vertical standards upside down, this makes later connection of further suspended vertical standards easier.

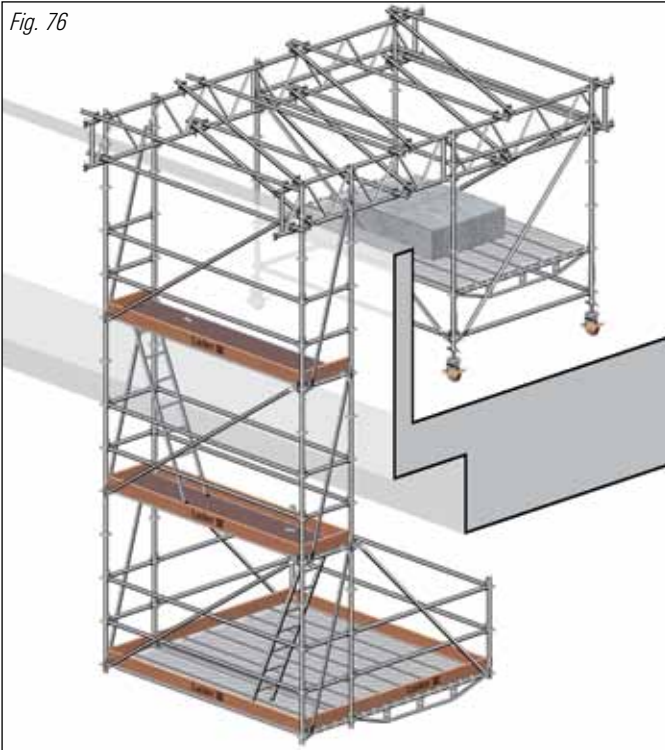
Fig. 75



6. Go to the level underneath.
7. Fit horizontal ledgers and insert decks.
8. Install the three-part edge protection.
9. Fit vertical diagonal braces on 3 sides. Preferably diagonal braces should be installed on the outside of the scaffolding.
10. Connect vertical standards with bolt-in spigots and secure them with 4 M12 nuts and bolts or hinged pins.

Repeat the working steps until the necessary depth has been obtained.

Fig. 76



⚠ WARNING

There is a risk of falls during assembly of the further scaffolding levels. Measures ascertained in the risk analysis performed by the scaffolding erector must be applied. Keep the hatches in access decks closed at all times! Only open them when needed, and close them again immediately afterwards!

11. Assemble the projecting part as described in the section on brackets and cantilevers.
12. Install the three-part edge protection.

Tip: Alternatively to the assembly sequences shown, individual segments (e.g. the suspended part) can be preassembled on the ground and then attached to the projecting section using a crane. This reduces the risk of falls. The work must be performed so that the time spent in activities where there is a risk of falling is as short as possible.

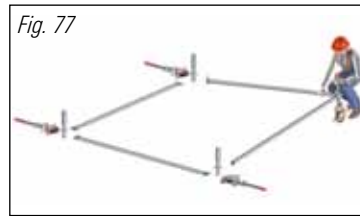
► 11. MOBILE SCAFFOLDING UNITS

The use of mobile scaffolding units allows work on large areas with a small amount of material. Mobile scaffolding units can be provided with wheels to make them into rolling towers, or designed as crane-movable units.

Rolling towers

Caution: No personnel or loose objects may be on rolling towers when these are being moved. Rolling towers may only be moved by exerting force on their base, never on the upper part of the structure. The wheels of the mobile tower must always be locked unless the tower is being moved. Mobile towers may only be moved on flat surfaces.

Fig. 77



1. Lay the ledgers at right angles to one another, and lay the extended base collars at the ends.
2. Place wheels at the ends.

Caution: The wheels must be locked when the rolling tower is being assembled.

3. Connect the first two ledgers in the small holes of the base collar and insert the wheel.
4. Connect in sequence the base collars, wheels plus ledgers, but do not knock in the wedges.
5. Align the foot/base of the rolling tower using a spirit level.
6. Install steel decks in the access area and secure them against lifting out. Knock in the wedges.
7. Place standards on the vertical base collars.
8. Continue installation as with scaffolding towers.