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1. Scope

- 1.1 Austroads Technical Specification ATS 4210 sets out the requirements for the supply and installation of steel beam safety barrier systems, including end terminals. It covers public domain systems and proprietary systems.
- 1.2 ATS 4210 may be used for new installations and for the repair or replacement of an existing steel beam safety barrier system.
- 1.3 The following are excluded from this Specification:
 - a) design of safety barrier systems;
 - b) wire rope safety barrier systems (refer to ATS 4220);
 - c) concrete safety barriers (refer to ATS 4230);
 - d) bridge barriers (refer to ATS 5840);
 - e) temporary safety barriers used during the construction of roadworks or bridgeworks; and
 - f) balustrades, pedestrian fences or other fences adjacent to roads.

2. Referenced Documents

- 2.1 The following documents are referenced in this Specification:

Australian/New Zealand Standards

AS/NZS 1163	Cold-formed structural steel hollow sections
AS/NZS 1214	Hot-dip galvanized coatings on threaded fasteners (ISO metric coarse thread series) (ISO 10684:2004, MOD)
AS/NZS 1365	Tolerances for flat-rolled steel products
AS/NZS 1594	Hot-rolled steel flat products
AS/NZS 1604.1	Preservative-treated wood-based products, Part 1: Products and treatment
AS 1627	Metal finishing
AS 1742.2	Manual of uniform traffic control devices, Part 2: Traffic control devices for general use
AS 1906.1	Retroreflective materials and devices for road traffic control purposes, Part 1: Retroreflective sheeting
AS/NZS 1906.2	Retroreflective materials and devices for road traffic control purposes, Part 2: Retroreflective devices (non-pavement application)
AS 2082	Timber – Hardwood – Visually stress-graded for structural purposes
AS 3569	Steel wire ropes – Product specification
AS/NZS 3678	Structural steel – Hot-rolled plates, floorplates and slabs
AS/NZS 3750	Paints for steel structures
AS/NZS 4680	Hot dip galvanized coatings on fabricated iron and steel articles – Specifications and test methods
AS/NZS 5131	Structural steelwork – Fabrication and erection
AS/NZS ISO 9001	Quality management systems – Requirements

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AGRD06	Guide to Road Design Part 6: Roadside Design, Safety and Barriers
ATS 1210	Temporary Traffic Management
ATS 1330	Management of Utilities on Site
ATS 4220	Wire Rope Safety Barrier
ATS 4230	Construction of Concrete Safety Barriers
ATS 5420	Supply of Steel Fasteners
ATS 5330	Supply of Geopolymer Concrete
ATS 5335	Normal Class Concrete
ATS 5840	Supply and Installation of Bridge Barriers

3. Definitions

3.1 In addition to the definitions in Appendix A of AGRD06, the following definitions and abbreviations apply to this Specification.

Accepted Steel Beam Safety Barrier Product: A steel beam safety barrier system that has been approved by the Principal and is subject to compliance with any conditions of use specified by the Principal.

ASHTAS: Austrroads Safety Hardware Training and Accreditation Scheme.

Design Documentation: Drawings, schedules and other documents, designated as such, required for the installation of the safety barrier system, including the Manufacturer’s Recommendations.

Manufacturer’s Recommendations: The approved specification, instructions, installation manual and/or drawings for an Accepted Steel Beam Safety Barrier System, prepared by or for the manufacturer, detailing the components, the system or device, and the methods and/or procedures for installation.

Proprietary Steel Beam Safety Barrier System: A steel beam safety barrier system that is subject to patent or other intellectual property rights within Australia and/or New Zealand.

Public Domain Steel Beam Safety Barrier: A steel beam safety barrier system that is not subject to patent or other intellectual property rights within Australia and/or New Zealand, the details of which are shown on the Principal’s standard drawings.

4. Quality System Requirements

- 4.1 The Contractor must prepare and implement a Quality Plan that includes the documentation in Table 4.1

Table 4.1 Quality Plan

Clause	Description of document
4.2	For a Proprietary Safety Barrier System, evidence that the system is an Accepted Safety Barrier System.
4.3	For Public Domain Safety Barrier, evidence that it is manufactured and supplied under a management system certified to AS/NZS ISO 9001.
7.1	Details of the equipment used. Procedures and Inspection and Test Plans for the installation of the safety barrier.

- 4.2 An Accepted Steel Beam Safety Barrier System must be used for all new safety barrier system installations. Acceptance may be conditional upon the safety barrier complying with specific requirements specified by the Principal. These specific requirements apply to the use of an Accepted Steel Beam Safety Barrier System, in accordance with this Specification.
- 4.3 All components of the safety barrier system must be manufactured and supplied under a quality system certified to AS/NZS ISO 9001. The certifying body must be accredited by the Joint Accreditation System of Australia and New Zealand (JAS-ANZ) or a member of the International Accreditation Forum.

HOLD POINT 1

Process Held	Installation of safety barrier system
Submission Details	The Quality Plan must be provided to the Principal at least 10 working days prior to the installation of the safety barrier system.

5. Materials and Components

General

- 5.1 Materials and components used in the safety barrier must comply with the requirements of this Clause 5, unless an alternative requirement is specified in the approved Manufacturer's Recommendations.

Steel

- 5.2 Unless approved otherwise by the Principal, the grade of steel used in the manufacture of the safety barrier must comply with Table 5.2.

Table 5.2 Grade of steel

Item	Standard	Requirement ⁽¹⁾
Posts and blocks	AS/NZS 1594	Grade HA 300
Beams and beam stiffening pieces	AS/NZS 1594	Grade HA 350, 2.7 mm base metal thickness
Strut ⁽²⁾	AS/NZS 1163	Grade C350.
Yoke ⁽²⁾	AS/NZS 3678	Grade 250
Tubes for breakaway posts and soil plates	AS/NZS 1594	Grade HA 250
Base plates	AS/NZS 3678	Grade 250

Notes:

1. Unless a higher grade or other requirements are specified by the Manufacturer.
2. The strut and yoke is the device used to connect the first and second posts at ground level in a terminal.

- 5.3 Welding and flame cutting may be undertaken only where shown on the Design Documentation. Where permitted, it must be undertaken in a workshop in accordance with the Manufacturer's Recommendations.
- 5.4 The base metal must comply with the tolerances in Table 5.4 when measured in accordance with the methods of AS/NZS 1365.

Table 5.4 Steel dimensional tolerances

Property	Tolerance (mm)
Camber in any 2.5 m length	±4.5
Base metal thickness (2.7 mm)	+0.21, -0.1 mm
Mill tolerance on strip width	+2.5, -0

Other Materials

- 5.5 Other materials used in the manufacture and/or installation of the safety barrier must comply with Table 5.5.

Table 5.5 Other materials

Item	Compliance requirement
Nuts, bolts and washers	ATS 5420
Wire rope for post and beam end treatments	AS 3569
Retroreflective materials and combination of fluorescent/retroreflective materials used in delineators	AS 1906.1 or AS/NZS 1906.2, as appropriate
Concrete	Grade N20 to ATS 5335; or 20 MPa Geopolymer binder-based concrete to ATS 5330
Timber (only if specified on the Design Documentation)	<ul style="list-style-type: none"> • Softwood: Strength grade F8 Australian Slash Pine, preservative treated to hazard level H4 in accordance with AS 1604.1 • Hardwood: Approved hardwood complying with AS 2082 Structural Grade No. 3

- 5.6 Timber (where used) must be straight and sound, and free from shakes, pipes, cores, flaws and other imperfections. The timber must be sawn parallel to the grain and any exposed knots must be sound, tight, well-spaced and not exceed 25 mm in size on any face.
- 5.7 Softwood (where used) must be treated by a preservative using a vacuum/pressure autoclave process in a facility approved by the Principal. The preservative used must not contain any chromium or arsenic. After treatment, the timber must not be re-sawn, dressed, planed or otherwise have its original dimensions altered.

Certification of Material Conformance

- 5.8 At least 10 working days prior to the installation of the safety barrier components, the Contractor must submit a signed statement certifying that the materials and components supplied comply with the requirements of this Specification. The statement must be signed by a person authorised by the Contractor to sign on its behalf. The certificate must be accompanied by:
 - a) the manufacturer’s name, product reference and date of manufacture;
 - b) the steel manufacturer’s test certificates showing full chemical composition, including the carbon equivalence, and mechanical test results for yield, tensile and elongation;
 - c) for galvanised steel components, a manufacturer’s certificate of compliance certifying that the zinc coating mass is in accordance with the requirements of AS/NZS 4680; and
 - d) details of the country of manufacture of each component.

HOLD POINT 2	
Process Held	Installation of the safety barrier system
Submission Details	The certificate of compliance for the materials and supporting documentation must be provided to the Principal at least 10 working days prior to the commencement of installation.

Fabrication

- 5.9 The safety barrier components must be fabricated in accordance with the Design Documentation and AS/NZS 5131, construction category CC2.
- 5.10 If the specified deflection/curvature of the steel beam exceeds 160 mm over a 4 m section, the curving must be undertaken in the fabrication workshop. The radius must be permanently marked on the rear of the barrier.
- 5.11 Where curved beam with a radius of less than 45 m is specified, the curving operation must be carried out prior to galvanising.

Protective Treatment

- 5.12 Unless the Accepted Steel Beam Safety Barrier System uses an alternative protective treatment, the surfaces of all ferrous metal components must be hot-dipped galvanised in accordance with AS/NZS 4680. Galvanising must take place after fabrication. The metal must be prepared for galvanising by the applicable methods specified in AS 1627 Parts 1 to 4, before being pickled in accordance with AS 1627.5.
- 5.13 Fabrication must be carried out in a manner that does not damage the galvanising. Galvanised components must have a bright zinc appearance, be smooth, adherent and free from stains, gross surface imperfections, markings, brand names and/or inclusions with uniform colour.
- 5.14 The hot-dipped galvanised coating on bolts, nuts and washers must comply with AS/NZS 1214.
- 5.15 Refer to Clause 9 if the coating is damaged.

Identification

- 5.16 All steel beams, posts and plastic components of a safety barrier must be permanently marked with the following information:
- name or mark of the manufacturer;
 - strength and base metal thickness of steel beams and posts; and
 - a traceable identification number.
- 5.17 The marking must be in text not more than 20 mm high and be in an unobtrusive and readily accessible position.

Material Handling and Storage

- 5.18 The Contractor must ensure that loading, transport, unloading, stacking and handling operations before and after fabrication, are carried out in such a way that items are protected from distortion and that galvanised surfaces are protected from damage.
- 5.19 All materials and components must:
- be stored in such a manner that damage and corrosion are prevented;
 - be stored at least 200 mm above the ground on platforms, slabs, or other supports under cover; and
 - be free of rust or other damage.
- 5.20 Components must be stored in such a manner that the freshly galvanised surfaces are protected from the attack of 'white rust'. The components must not be transported or stored under damp or badly ventilated conditions (including stacking components in close contact with each other).
- 5.21 If stacks are located behind a serviceable road safety barrier system, the clear space between the road safety barrier system and the stack must allow for the Working Width of the system and be at sufficient distance from the ends of the system to allow the proper functioning of the end treatments.

6. Personnel

- 6.1 The installation, repair or maintenance of a safety barrier system must be undertaken by a person who is accredited under the ASHTAS for the safety barrier system that is being installed, repaired or maintained.

7. Installation

General

- 7.1 The Quality Plan must include the following documentation:
- details of the equipment used to install the safety barrier components;
 - procedure for installation of the safety barrier components; and
 - the Inspection and Test Plan for verifying that the safety barrier components are installed in accordance with this Specification.
- 7.2 The safety barrier system must be installed in accordance with the Design Documentation, and the Principal's conditions of use attached to the acceptance of a product (if any).

- 7.3 Prior to commencing the installation of the safety barrier system, the Contractor must ensure that the position of all Utilities in the proximity of the Works has been verified and any necessary protective measures implemented in accordance with ATS 1330. If an unknown Utility is encountered during the installation process, the requirements of ATS 1330 will apply.
- 7.4 The installation of the safety barrier system must be undertaken in accordance with the Traffic Management Plan (refer to ATS 1210).
- 7.5 Where the safety barrier system is being constructed on a road open to traffic, the work must commence at the end closest to approaching traffic, except where the barrier connects at its departure end to a fixed object, such as an existing barrier.
- 7.6 The work must be carried out so end treatments and transitions can be commissioned at the earliest practicable time. Where this cannot be achieved on the same day that the remainder of the safety barrier system is installed, temporary end treatments in accordance with the Traffic Management Plan must be provided until the permanent treatment is complete.
- 7.7 Welding or flame cutting of any component of a safety barrier system in the field is not permitted.

Set Out

- 7.8 Prior to installation, the Contractor must set out the alignment of the posts, transitions and terminals (including the line of flare if applicable) using pegs or other suitable marking system. The Contractor must verify that:
 - a) there are no impediments on the Site that impede the construction of the safety barrier system in the correct position; and
 - b) the position of the posts comply with all specified requirements, such as offset from the batter hinge point (as described in AGRD06) and the minimum clearance required for the Working Width.
- 7.9 If a previously unknown impediment to installation or a non-compliance with a specified requirement is identified, the Principal must be notified as soon as practicable and before post installation commences.

WITNESS POINT 1	
Process	Installation of posts
Notification Period	At least 2 working day prior to the commencement of post installation.

Posts

- 7.10 Posts must be installed by driving unless the driving will damage the post and/or the post is to be installed in rock, asphalt, concrete or a heavily bound pavement layer, in which case the post must be installed in a hole. However, in weak rock, pre-boring may be used to assist the installation of a post without causing damage to the post.
- 7.11 If the post cannot be installed by driving, the Contractor must notify the Principal before commencing excavation of the hole for the post.

WITNESS POINT 2 (WHERE APPLICABLE)	
Process	Excavation of hole for post
Notification Period	At least one working day prior to the commencement of the post hole.

- 7.12 Unless the Manufacturer’s Recommendations specify otherwise, the following applies where a hole is used for post installation:
- a) a hole of at least 400 mm diameter must be excavated or bored to within 300 mm of the bottom of the post or to not less than the underside of the constraining material, whichever is the shallowest;
 - b) the hole must be located so that the intended location of the post is aligned either centrally in the hole or closer to the side of the hole closest to the traffic lane from which most errant vehicles will originate;
 - c) the hole must be cleaned and backfilled around and within the open section of the post; and
 - d) all surplus excavated material must be disposed of at a location that is off site.
- 7.13 Unless specified otherwise, backfill material must be sand or granular material that has similar properties to the adjacent pavement layers. It must be placed in layers not exceeding 150 mm and compacted to not less than the density of the adjacent pavement layers. Cement must not be added to the backfill material.
- 7.14 A Hold Point applies if:
- a) a post cannot be installed in accordance with the Design Documentation (e.g. an obstruction prevents the installation of a post); and/or
 - b) the Contractor proposes to install a post of a length not shown on the Design Documentation or install other special measures (e.g. shallow concrete foundations).
- 7.15 If Clause 7.14 applies, the Contractor must submit details of the measures proposed and evidence that the effectiveness of the safety barrier system will be maintained. Where a shallow foundation that requires a concrete ground beam is proposed, the design must be proof engineered by a professional engineer who has been approved by the Principal.

HOLD POINT 3 (WHERE APPLICABLE)	
Process Held	Installation of a non-standard post or other special measures
Submission Details	Details of the proposal and any necessary supporting information must be submitted to the Principal at least 2 working days prior to the installation non-standard post or other special measures.

- 7.16 Post holes in rock (other than anchorage posts) must be backfilled with granular material or other material approved by the Principal. Unless specified otherwise, other post holes must be backfilled with selected earth, free of rock.
- 7.17 The backfilling must be firmly compacted in layers not exceeding 100 mm compacted thickness.
- 7.18 Where posts are located in areas that are to be paved with concrete or premixed bituminous material, the backfilling of the post holes must be finished 50 mm below the underside of the paving. The remaining depth of the holes must be filled and compacted with material similar to the surrounding pavement material.

Load Testing of Post Foundations

- 7.19 If specified in the Contract documents or directed by the Principal, horizontal load testing of posts must be undertaken prior to the installation of the beam. At least one test must be carried out for each safety barrier installation or. An additional test must be carried out if there is a change of soil type.
- 7.20 The horizontal load test is carried out by applying a 1 kN force, 200 mm below the top of the post in any direction. The test may be carried out by using a lever hoist or equivalent and calibrated load cell anchored to a truck. National Association of Testing Authorities (NATA) or International Accreditation New Zealand (IANZ) accreditation is not required for the horizontal load test.

- 7.21 A video recording and/or photographs of each test must be taken and submitted to the Principal with the Completion Report (refer to Clause 11.1). The location of each test must be recorded. Any post foundations that are disturbed or damaged by the test must be rectified.
- 7.22 The post foundation is deemed to be nonconforming if the displacement at ground level exceeds 3 mm. For any post failing the test, the post must be rectified and retested and in addition, one other similar post within 5 m must also be tested.

Location of Posts Adjacent to Batter Hinge Points

- 7.23 If the specified position of a post is less than the Working Width from the batter hinge point (as described in AGRD06), the Contractor must:
 - a) increase the depth of footing in accordance with the Manufacturer’s Recommendations;
 - b) provide a written statement of advice from the manufacturer based on geotechnical testing confirming the required depth of footing; and
 - c) undertake a horizontal load test in accordance with Clause 7.20 at 45 degrees to the safety barrier in all directions at locations nominated by the Principal.
- 7.24 Notwithstanding the Manufacturer’s Recommendations, a post must not be installed within 500 mm of the batter hinge point.

Beams

- 7.25 Steel beams must be lapped so that the exposed ends face away from near side approaching traffic.
- 7.26 All bolts used in safety barrier construction, other than nuts on wire rope assemblies, must be tightened by at least 2 impacts of an impact wrench or by the full effort of a person using a standard podger spanner in accordance with Clause 8.2.3 of AS/NZS 5131 (‘snug-tight’).
- 7.27 All bolts on the traffic side of W-beam installations must be flush with the W-beam.
- 7.28 If the installation of a steel rub rail or other proprietary under-run system for the protection of motorcyclists is specified, a gap must be provided between the rub rail and the ground to allow for passage of water, litter and leaves. The size of the gap must be as specified on the Design Documentation.
- 7.29 The position of the ground surface for measurement mounting height must be measured in accordance with Table 7.29. The height must be measured vertically to the centre of the steel beam.

Table 7.29 Mounting height

Location of safety barrier	Position of ground surface for measurement
Within the pavement	The pavement surface
Adjacent to the pavement	From the line of pavement crossfall extended to the barrier line
All other circumstances	As shown on the Design Documentation or as directed by the Principal

Cables in End treatments

- 7.1 During installation of wire ropes in the end treatments of the safety barrier, the Contractor must ensure that rope is not twisted. When rope assemblies are used, the nuts at each end of the rope must be tightened to a minimum torque of 50 Nm on the assemblies or in accordance with the Manufacturer's Recommendations.
- 7.2 The Contractor must maintain tension in the wire ropes in end treatments by keeping the nuts at both ends tightened to 50 Nm, or in accordance with the Manufacturer's Recommendations. This applies when Practical Completion or Completion (as the case may be) is achieved.

Interface with Other Safety Barriers

- 7.3 Unless specified otherwise in the Contract documents, the Contractor is responsible for any alteration and/or relocation of any adjacent existing safety barrier system to ensure the proper functioning of the new safety barrier system. This may include dismantling and reinstating existing safety barrier (including terminals) and any minor site works. If a wire rope safety barrier system requires alteration and/or relocation, that work must be carried out in accordance with ATS 4220.
- 7.4 A new steel beam safety barrier system may be connected to an existing steel beam safety barrier system where specified in the Design Documentation.

Delineators

- 7.5 The Contractor must supply and fasten delineators to the safety barrier system, comprising of flexible plastic mounting brackets fitted with 100 cm² of Class 1A retro-reflective material, as defined in AS/NZS 1906.2. Delineators must be installed at the spacing specified in AS 1742.2, or the Design Documentation, whichever gives the closer spacing.
- 7.6 Delineators must be installed to the top of the steel beam and in accordance with any applicable Design Documentation. The delineators must be positioned so that vehicles approaching from either direction at night will only see:
 - a) red delineators on the left side of one-way and two-way roadways;
 - b) white delineators on the right side of two-way roadways; and
 - c) yellow delineators on the right side of one-way roadways and medians separating traffic in opposing directions.
- 7.7 Delineators must not be installed on a safety barrier when the barrier offset is greater than 4 m from the traffic lane.

8. Removal of Existing Roadside Furniture

- 8.1 Existing roadside furniture (including safety barriers and guideposts) must be removed where shown on the Design Documentation. If any of the following scenarios apply and removal is not shown on the Design Documentation, the Contractor must notify the Principal accordingly and seek a direction in regard to their removal:
 - a) the roadside furniture will be made redundant by the installation of the safety barrier system;
 - b) the roadside furniture is located within the Working Width of the safety barrier system at the nominated test level;
 - c) a guidepost is located in front of a new safety barrier system within a 4 m offset from the traffic lane; or
 - d) a guidepost is located behind the new safety barrier system and is greater than 4 m offset from the traffic lane.

- 8.2 Where the safety barrier system being removed is on a road open to traffic, the removal must be coordinated with other work at the Site to eliminate or minimise the exposure of an incomplete safety barrier system to traffic. Where practicable, removal of a safety barrier system must commence from the departure end (remote from the approach of traffic).
- 8.3 Unless specified otherwise in the Contract documents, the following applies to the demolition of any existing safety barrier or other roadside furniture:
- a) all components of the redundant safety barrier and any waste materials must be removed from the site in accordance with the environmental management requirements included in the Contract documents;
 - b) any other roadside furniture (such as guide posts or bollards) that has been made redundant by the installation of the safety barrier, must be removed from the site;
 - c) any holes remaining after the removal of redundant roadside furniture must be cleaned and backfilled with similar materials to existing surrounding layers or imported granular material; and
 - d) the backfilled material must be compacted in layers not exceeding 150 mm thickness to not less than the density of the surrounding material.

9. Damage and Reinstatement

- 9.1 Components of the safety barrier system must not be damaged at any stage during supply, fabrication or installation. However, if the damage is limited to the protective coating, repair in accordance with Appendix E of AS/NZS 4680 is acceptable, subject to the following:
- a) if practicable, the damage is repaired immediately, but in any case, within 24 hours;
 - b) the damaged area does not exceed 40 cm² for any individual point repaired and a total 0.1% of the surface area of any face (for multiple repairs);
 - c) at least 2 coats of a zinc-rich paint in accordance with AS/NZS 3750.9 ae used; and
 - d) the colour of the original surface is matched by either directly or by applying a further compatible treatment.
- 9.2 If the coating cannot be repaired in accordance with Clause 9.1, the component must either be replaced with a conforming component or re-galvanised in accordance with this Specification.
- 9.3 If, during the period that the Contractor is responsible for the care and control of the Works, the safety barrier system is damaged by an errant vehicle, the Contractor must:
- a) implement traffic management measures and make the area safe as soon as practicable after becoming aware of the damage;
 - b) repair the damage within 5 working days of becoming aware of impact damage to the safety barrier system; and
 - c) provide a report to the Principal of each vehicle impact where the safety barrier system has been damaged.
- 9.4 Any property of the Principal (such as kerb and channel, footpaths, verges, signs and traffic control devices) that is damaged or temporarily removed/relocated during the execution of the works must be reinstated to its original location as soon as practicable and to a standard not less than the pre-existing condition.

10. Tolerances

10.1 The variation between the actual position and the installed position of each safety barrier component must not exceed any of the tolerances specified in Table 10.1 and any tolerances specified in the Manufacturer’s Recommendations.

Table 10.1 Installation tolerance

Attribute	Tolerance
Posts	
• Deviation from vertical (measured at top of the post)	±15 mm
• The spacing between posts, measured at the top of the beam	±25 mm
• Variation from the specified plan position of a post in any direction	±20 mm
• The deviation of the top of any post from a straight line joining the tops of the posts on either side, after allowing for horizontal and vertical curves	±10 mm
• Height of a post	±20 mm
Beams	
• Variation of line of steel beams from specified vertical profile	±10 mm; and ≤15 mm deviation in any 5 m length
• Variation of steel beams from specified horizontal alignment	±20 mm; and ≤15 mm deviation in any 5 m length
• Top of bolt head relative to steel beam	-0 mm, +5 mm
Blockouts	
• Total rotation of blockout and post ⁽¹⁾	±30 mm
Footings	
• Dimensions of an excavation for a footing	-0 mm, +50 mm

Note:

1. Measured in plan at the top of the beam and at the point of greatest offset between the blockout and the steel beam.

10.2 Where the rail is supported on a shelf angle, there must be no horizontal or vertical gap between the rail and the inner faces of the shelf angle.

10.3 Notwithstanding the requirements specified in this Clause 10, the line and level of the steel beam safety barrier must be adjusted where necessary to provide a smooth and even vertical and horizontal alignment.

11. Completion

General

- 11.1 As a condition precedent for payment and for Completion or Practical Completion (as the case may be), the following must be submitted to the Principal:
- a) certification of materials and supporting documentation required under Clause 5.8;
 - b) a copy of each completed Inspection and Test Plan and photographic records demonstrating compliance with Clause 6;
 - c) a Certificate of Compliance and supporting documentation required under Clause 11.3; and
 - d) the 'As-constructed' and maintenance documentation under Clause 11.5.

Certificate of Compliance

- 11.2 The Contractor must arrange for a compliance audit of each Proprietary Safety Barrier System constructed under the Contract. The audit must be undertaken and a report prepared by the approved Australasian supplier of the safety barrier system.
- 11.3 A Certificate of Compliance, signed by the Contractor's Representative and the supplier of the Accepted Steel Beam Safety Barrier System and all documentation supporting that certification must be submitted to the Principal. The Certificate of Compliance must certify that the safety barrier system has been installed in accordance with the Manufacturer's Recommendations, this Specification and the Principal's conditions of use (where applicable). A Certificate of Compliance must be provided for each end treatment installed.
- 11.4 A person who undertakes the installation, repair and/or maintenance of safety barrier systems and is licensed under the ASHTAS may certify that the work is conforming work in lieu of a Certificate of Compliance. Any certification of installation, repair, or maintenance work must correspond to the safety barrier system for which the individual is accredited.

'As-constructed' and Maintenance Documentation

- 11.5 The Contractor must submit the following documentation to the Principal:
- a) installation and maintenance manuals for each Proprietary Safety Barrier Systems installed;
 - b) 'As-constructed' drawings; and
 - c) any other information required by the Principal for inclusion in its asset management system.

Annexure A Summary of Hold Points, Witness Points and Records

The following is a summary of the Witness Points/Hold Points that apply to this Specification and the Records that the Contractor must submit to the Principal to demonstrate compliance with this Specification.

CLAUSE	HOLD POINT	WITNESS POINT	RECORD
4.1			Quality Plan
4.3	1. Installation of safety barrier system		
5.8	2. Installation of safety barrier system		The certificate of compliance and supporting documentation
		1. Installation of posts	
7.11		2. Excavation of hole for post	
7.15	3. Installation of a non-standard post or other special measures.		Details of the proposal and any supporting information
11.1			Evidence of Compliance

Amendment Record

Edition no.	Clauses amended	Action	Date
1.0	New specification	New	January 2026

Key

Format	Change in format
Substitution	Old clause removed and replaced with new clause
New	Insertion of new clause
Removed	Old clauses removed