QUAD-DECK

Plastbau® Technology

Insulating Concrete Forms for Floors & Roofs

Design Manual

Version: QDDM-02
Released April 2016

Welcome to Quad-Deck!

This Manual includes many details and practices that are accepted standards for concrete formwork in many areas, as well as some that are unique to Quad-Deck, or used or allowed only in specific jurisdictions. Locally applicable building code and legal requirements may be different and shall prevail in all cases. Quad-Lock representatives and technical support staff will assist in providing solutions:

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Quad-Lock Building Systems reserves the right to update this manual as appropriate and asks that you check online for the most recent version or request a printed copy, if needed.

Safety First

DANGER! DEFECTS IN THE REINFORCED CONCRETE, FORMWORK, OR SHORING CAN LEAD TO STRUCTURAL FAILURE, BUILDING OR FORMWORK COLLAPSE, INJURY AND DEATH. Cast-in-place suspended concrete slabs formed by Quad-Deck must be designed & built according to all locally applicable laws, building codes, and other regulations, standards, and best practices. Each building's construction team (owner, architect, engineers, general contractor, installers) is responsible for adequate building design, installation, quality control, and safety. Inexperienced persons should not perform cast-in-place concrete construction. In the event of a conflict between anything in the Manuals and the local building code, provisions of the local building code shall apply. A 30' x 30' [9.1m x 9.1m] Quad-Deck floor or roof deck can weigh between 62,000 lbs. [28,123 kg] and 95,000 lbs. [43,090 kg] not including crews.

Installers must know & follow all applicable safety regulations and best practices.

Some Examples (non-exhaustive):
Never use defective or sub-standard shoring, formwork, reinforcement, or concrete.
Always inspect each Quad-Deck panel BEFORE placement on shoring:

- Both metal ribs must be straight and continuous
- EPS must be well-fused (beads are bonded together, providing part strength)

Never place excessive loads on formwork (don't step into Quad-Deck beams, don't "heap" concrete or place other heavy loads onto formwork).
Never enter areas underneath slab formwork during or after the concrete pour until cleared to do so. Block all access to those areas during those times.
Never remove any shoring until cleared to do so, usually by the Engineer.
EPS is combustible and must not be exposed to ignition sources or high heat.

IMPORTANT NOTE: Reinforced Concrete: The installer is responsible for placement of all reinforcing steel and concrete in accordance with, but not limited to, ACI (American Concrete Institute) 318 "Building Code Requirements for Structural Concrete", NBCC and/or CAN/CSA A23, and/or any other current applicable codes and regulations. Any variance from those standards must be provided and certified in advance by a structural engineer, licensed for the jobsite location and specifications.

IMPORTANT NOTE: Shoring and Bracing: The installer is responsible for the design and correct installation of bracing and shoring of the Quad-Lock ICF Wall System and/or the Quad-Deck/Tilt-Deck System in accordance with, but not limited to, ACI (American Concrete Institute) 347 "Guide to Formwork for Concrete", NBCC and/or CAN/CSA A23, and/or any other current applicable codes and regulations. Any variance from those standards must be provided and certified in advance by a qualified engineer, licensed for the jobsite location and specifications.

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Warning about corrosion of metal components
Quad-Deck metal ribs are galvanized to minimize risk of corrosion, however, please be aware that:

1. Metal connectors, anchors, fasteners, and other metal components will corrode and lose load carrying capacity, if installed in corrosive environments.
2. Many new types of treated lumber are highly corrosive to metal components, especially wood treated with ACQ (alkaline copper quaternary).

Quad-Lock recommends that metal components should NOT be used in contact with treated lumber in exterior applications or anywhere water or moisture is likely to be present (unless you ensure compatibility of your treated lumber with the metal components). For exterior applications, the Engineer of Record should specify the type, size and spacing of corrosion resistant bolts, concrete anchors, and other metal fasteners.

Table of Contents

1 QUAD-DECK FOR RESILIENT & SUSTAINABLE BUILDINGS

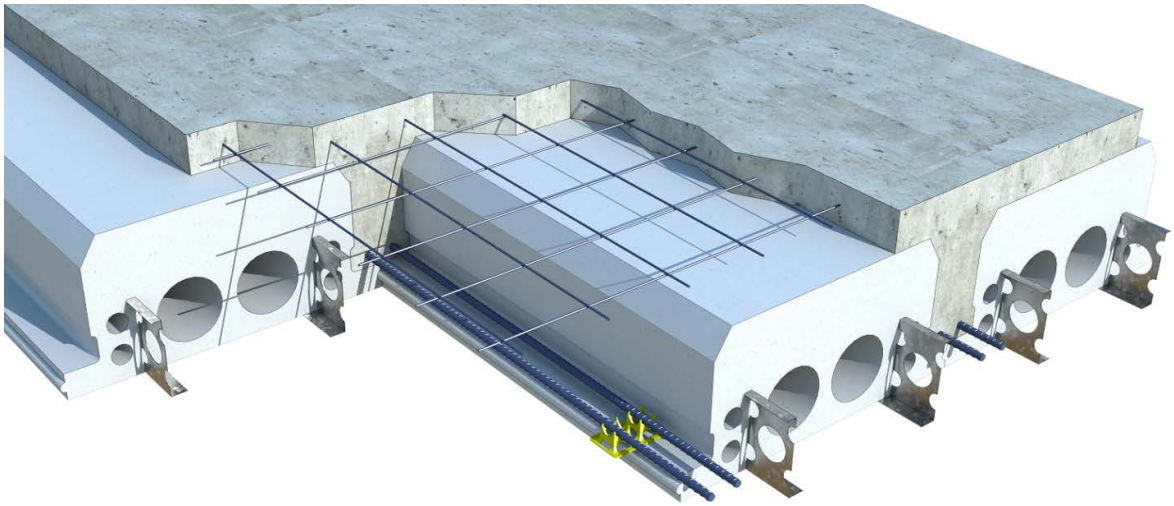
1.1 Quad-Deck Overview

Quad-Deck was invented to minimize the building mass, reduce shoring requirements, and increase the speed and efficiency of the construction of floors & roofs of **resilient and sustainable buildings that offer improved Indoor Environmental Quality at lower Total Cost of Ownership** than traditional buildings.

Quad-Deck is a light weight, stay-in-place, concrete formwork system designed to build insulated, reinforced concrete **T-beam slab** floors and roofs, typically cast-in-place, but also as tilt-up or pre-cast panels.

In a patented process Quad-Deck Panels are made of proven **expanded polystyrene (EPS) insulation** with a flame-retardant, which is **molded around perforated, Z-shaped metal ribs** that act as both secondary shoring / formwork support during construction and as attachment points for finishes.

When the concrete has reached full strength and the primary shoring has been removed, the forms stay in place to function as insulation, space to run utilities, and backing for finishes.



Metal Ribs exposed for illustration purposes, in reality they are nearly flush with EPS panel ends.

1.2 Resilience & Sustainability of Quad-Deck Structures

Integration of Quad-Deck assemblies into an overall building design can support many of today's objectives for new buildings. Indoor environmental quality (IEQ), durability, energy conservation, reduction of material use and waste, and use of recycled materials are all supported by designs incorporating Quad-Deck.

1.2.1 Indoor Environmental Quality

Owners and occupants of Quad-Lock ICF buildings consistently praise their living comfort and noise reduction:

Thermal Comfort

- Insulated Concrete Shells help to not only reduce thermal conduction, but also nearly eliminate unwanted air transfer between indoors and outdoors (air infiltration). **Cold drafts and cold spots are a thing of the past**.
- The thermal mass of concrete keeps indoor temperatures very consistent, even through most power-outages.

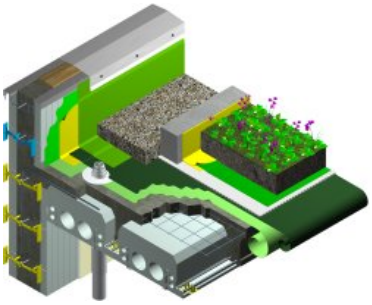
Indoor Air Quality

- With the high airtightness of concrete shells and proper detailing, **Indoor Air Quality can be controlled** to almost any level required, e.g. adding filters, humidifiers etc.
- Quad-Deck assemblies are made entirely of inert materials with **no off-gasing during normal use**.

Sound Transfer

Quad-Deck assemblies finished by normal means can provide airborne sound transmission losses of **STC 50 a better**. Quad-Deck assemblies with typical impact-sound attenuation layers, such as rubber underlayment, can reduce impact sound transmission at **IIC 48 and better.**

1.2.2 Resilience & Durability of the Structure



Long term durability and survivability of structures are emerging as primary objectives of resilience and sustainability criteria (and building codes) around the world. **Savings on insurance and energy costs** are often a major component of the financial justification of Quad-Deck projects, besides **higher resale values** after many decades, **reduced construction timelines**, and/or **higher occupancy rates & rents** due superior indoor environments.

Seismic Resistance

Quad-Deck's monolithic T-beam slabs can be engineered for high structural support for the entire building. Quad-Deck assemblies are designed under the same code criteria as any other suspended concrete structure.

- **Lower Total Mass** (approximately 40%) reduces the potential for load acceleration during seismic events when compared to conventional concrete slabs. Lower loads on supporting elements often allow their downsizing as well.
- Monolithic reinforced concrete T-beam + Slab design provides all its well-known resistance to shear, deflection and other forces. The Quad-Deck assemblies can be fully anchored into supporting walls/beams/columns etc.
- All common additional reinforcement options such as stirrups can be accommodated.

Wind Resistance & Flying Debris

As mentioned above, Quad-Deck floor/roof assemblies can be designed to provide all the structural support to the building for almost any level of wind-resistance. Concrete slab thicknesses can be chosen to resist the impact of most flying debris associated with extreme winds like hurricanes or tornadoes.

Water, Moisture and Mold Resistance

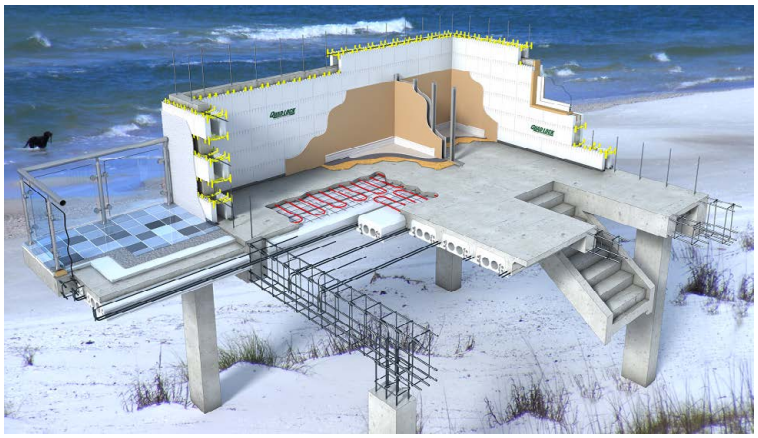
Concrete structures offer the best resistance to damage from water & moisture of any major building material when designed and built correctly. Quad-Deck EPS/concrete assemblies are very inert and greatly reduce the risks from mold growth or damage from wetting.

- Quad-Deck assemblies are ideal for supporting green roofs, combining moisture resistance with high structural load capacities.
- Quad-Deck assemblies that are exposed to weather can be waterproofed by conventional membranes and/or by internal crystalline concrete admixtures.
- Quad-Deck EPS insulation limits the insulation's water absorption (unlike most insulation products) and it has sufficient "drying capacity" to overcome temporary saturation by water due to flooding or burst pipes, without degradation of the insulation or the structure.
- EPS used in Quad-Deck panels does not support growth of mold or mildew, even under their ideal temperature and moisture conditions.

Fire Resistance

Quad-Deck assemblies are easily designed to comply with many local and national standards for resistance to fire.

- Fire Resistance Ratings (in hours) can be determined using the concrete slab thickness placed at the top of the assembly. Typically, a 1 hour FRR is achieved with a 3 ½ inch [89 mm] slab thickness. See Fire Resistance Ratings.
- Passage of fire between floors must be eliminated using seamless connections of the Quad-Deck assemblies to the supporting wall structures.
- Like any suspended concrete floor/roof, penetrations through the Quad-Deck assembly can be protected with off-the-shelf fire guard products.
- Flame-retardant EPS assemblies are proven to meet and exceed national criteria for flame-spread and smoke developed, using a minimal value thermal barrier such as ½" drywall.



Flood Resistance

Construction of insulated bottom slabs for **elevated buildings in flood-zones** is an ideal and popular application of Quad-Deck.

1.2.3 Energy Efficiency & Conservation

Stay-in-place ICF formwork like Quad-Deck is intended to leave behind layers of world-class EPS insulation that's been proven to retain its insulation value long term and to help manage the adverse effects of water and vapor.

EPS Insulation: Long-Term Thermal Resistance (LTTR) and Drying Capacity

- Depending on panel thickness, stock Quad-Deck panels provide R-values ranging from R-16 [U- 0.35] to R-33 [U-0.17] making them a valuable thermal protection layer in many designs.
- EPS insulation has been calculated to provide energy savings amounting to about 100 times the energy used for its manufacture over a 50 yr. lifespan.
- EPS in Quad-Deck assemblies retains its insulating value over time and does not degrade with age (unlike XPS).
- Moisture absorption in EPS is limited and environmental cycling test proved excellent drying capacity of EPS.

Concrete: Airtight and Massive

Monolithic concrete shells are nearly **airtight to minimize air infiltration**, THE major cause of energy losses in most buildings. Concrete also ads **high thermal mass** to the structure, a key component for passive solar designs.

1.2.4 Reduction of Material Consumption and Waste

Reduction of Concrete Consumption

A typical Quad-Deck assembly design uses about **40% less concrete** than full-depth two-way slab designs. This often also **allows supporting elements (e.g. walls) to be downsized**, further reducing materials needed.

Reduction in Steel Consumption

The "one-way" design of the Quad-Deck T-beam assemblies can reduce total steel consumption by as much as 50% when compared to two-way slab reinforcement.

Waste Reduction

- Quad-Deck panels are "made-to-order" from approved plans for each structure, eliminating most site cutting and disposal of waste.
- Waste from (infrequent) site-cutting is minimal, and 100% recyclable.

1.2.5 Recycled Materials

Quad-Deck's metal ribs are made from commercial steel with recycled content. The percentages vary by order, but typical recycled content is 15% post-consumer and 10% pre-consumer. Quad-Deck Panels' EPS insulation is not made from recycled materials due to unique requirements for part strength. It is possible to add recycled materials to the concrete and other components of the Quad-Deck assembly

- Recycled materials like **fly ash and blast slag** are commonly used in concrete mix designs for Quad-Deck assemblies.
- Concrete reinforcement with recycled content can be used in Quad-Deck assemblies.

1.3 Referenced Standards & Publications

ACI 216 Standard Method for Determining Fire Resistance of Concrete and Masonry Construction Assemblies
ACI 224.3R Joints in Concrete Construction
ACI 301 Specifications for Structural Concrete
ACI 318 Building Code Requirements for Structural Concrete
ACI 332 Guide to Residential Cast-in-Place Concrete Construction
ACI 347 Guide to Formwork of Concrete
ACI 347.2R Guide for Shoring/Reshoring of Concrete Multistory Buildings
ANSI A10.9 American National Standard for Construction and Demolition Operations
ASCE 24 Flood Resistant Design and Construction
ASCE 37 Design Loads On Structures during Construction
OSHA 29 CFR Construction Safety and Health Regulations for Construction
CSA A23.1 Concrete Materials & Methods of Construction
CSA A23.2 Methods of Test and Standard Practices for Concrete
CSA A23.3 Designing Concrete Structures
CSA S269.1 False work for Construction (Reaffirmed 1998)
CSA S269.3-M92 Concrete Formwork
NBC 2010 National Building Code of Canada 2010
ASTM E84 / UL 723 Surface Burning Characteristics of Building Materials
FEMA 320 Taking Shelter from the Storm: Building a Storm Room for your House or Small Business
FEMA 361 Design and Construction Guidance for Community Safe Rooms

1.4 Quad-Deck Features & Options

1.4.1 Panel Thickness Options

For varying insulation requirements and because the span and load capacity of the one-way T-beam structure is largely supported by the height of the “joists”, Quad-Deck panels are available in various thicknesses:

- Manufactured thicknesses from 7" [178mm] to 12.5" [318mm], see below.
- Greater thicknesses can be assembled onsite using additional insulation board, called EPS Top Hats.
- Insulation Values range from R-16 to R-33 for standard thicknesses, see 2.13.1 Insulation Values.

The Quad-Deck Estimating program can help in initial budgeting of the most economical panel & slab configurations for each project. For an estimate, please contact us at www.quadlock.com/contact.

1.4.2 Panel Width & Lengths

Panels manufactured in the USA and Canada are **24 inches [610mm] wide** (600mm elsewhere). Adjustments in panel width at beginning or end of a panel layout are easily made onsite with hand or power saws.

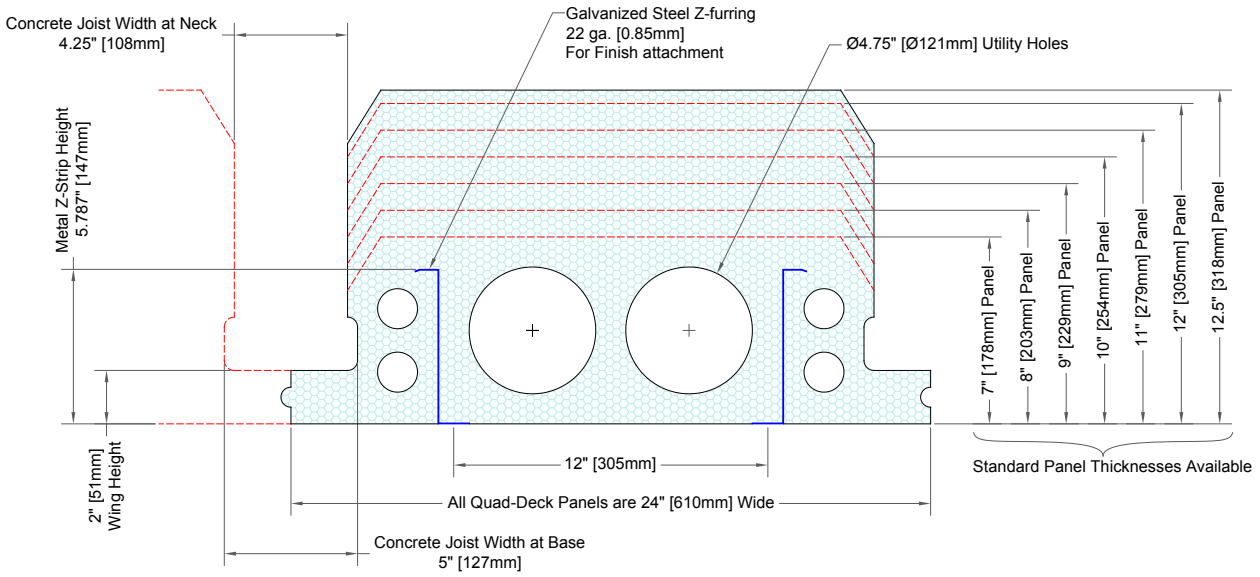
Panels are **custom-made to any lengths required** for the specific project to speed up installation, limited to about 40 feet in the N. American manufacturing facilities. However, other jobsite & shipping considerations may affect choice of panel length:

- Long panels can be cumbersome to maneuver on the jobsite. Quad-Lock recommends a **practical maximum length of about 35 ft** [10.6 m].
- Shipping vessel utilization may be maximized by changing the length of some panels, e.g. shipping some panels at half-length may reduce the number of required trucks/containers, supporting the seam with additional primary shoring members.

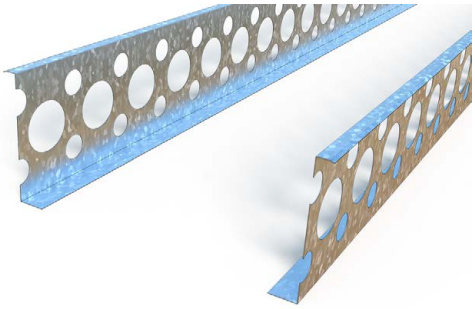
1.4.3 Panel Shape

Quad-Deck Panels are uniquely shaped to meet various requirements, such as the bevels along the top edges to reduce the risk of concrete cracks. All service chase, metal rib, and side wing dimensions remain the same for all panel thicknesses. Each panel has two large round chases molded in at 4.75" [120mm] in diameter and can be used to accommodate larger utilities after the concrete pour and sufficient curing. The four smaller chases are the result of the patented manufacturing process and can be used for small utilities.

On both sides of each panel are 2" [51mm] thick “wings” with tongue-and-grove interlocks. They form the base of the concrete beam pocket when placed next to another panel.



1.4.4 Metal Ribs



Two **continuous** metal ribs are **molded into each panel**:

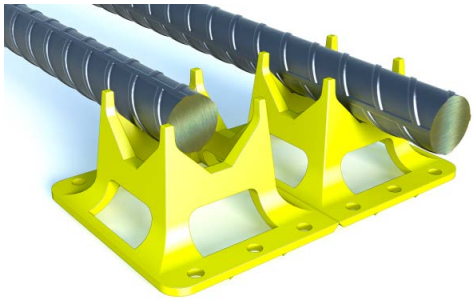
- The “Z” shaped galvanized metal ribs add strength to the panels while they are supporting crews, reinforcing, and concrete before, during, and after the pour, eliminating the need for plywood and secondary shoring.
- **1.25" [30mm] wide continuous 22 gauge** exposed metal strips every 1’ [305mm] OC on the bottom of the panels serve as attachment point for finishes and lightweight services.

1.4.5 Quad-Deck Accessories

Foam Plugs for Large Holes

Each order comes with the required amount of EPS Foam Plugs to cover the large holes on both ends of the panels. Fit a Foam Plug into each large hole at panel ends to avoid concrete flow into the chases. Foam Plugs are sized to pressure-fit into holes; adhesive is optional. Foam Plugs should be stored safely to prevent getting blown away or being lost.

Double Rebar Chairs

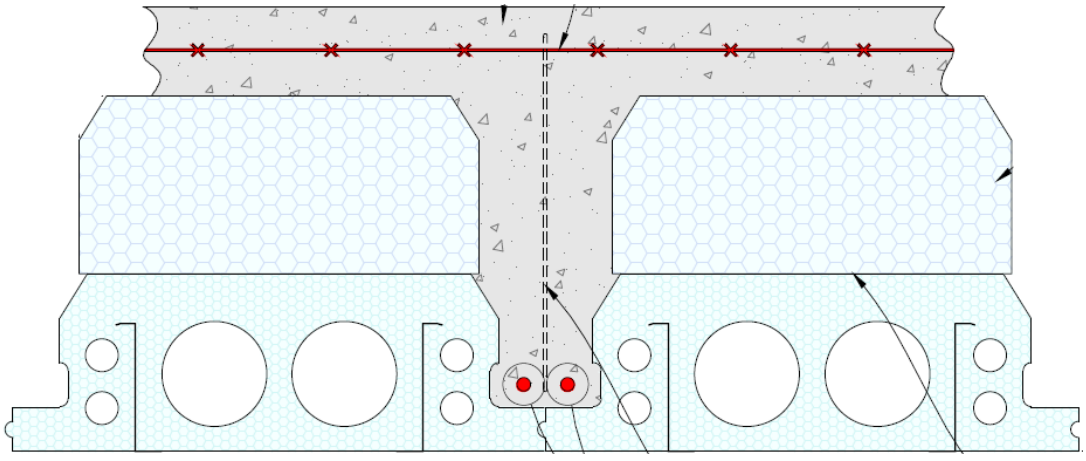


Quad-Deck Panels can be supplied with molded HDPE plastic double rebar chairs to support reinforcing bars located in the bottom of beams. Plastic rebar chairs are a double design to support up to two #8 [25M] parallel reinforcing bars, yielding a minimum ¾ inch clearance from the bottom of each T-beam and lateral separation of min. 1 inch [25mm] between bars. Quad-Deck rebar chairs are usually placed at 4 ft [1.2m] intervals along the length of the rebar. They can be split in half for single bar use.

NOTE: Minimum concrete coverage of reinforcing steel (clearance from formwork) is a critical issue in reinforced concrete structures. Consult job-specific engineering specifications in all cases for minimum concrete cover and other placement requirements.

EPS Top Hats

The span, load, and/or insulation values of Quad-Deck can be further increased using EPS blocks glued to the top of Quad-Deck Panels. The “Top Hats” are custom-ordered and custom-made for the project’s requirements.
See **QD-108** in Appendix A: Quad-Deck Typical Details.



Special consideration must be given to the following:

- Do not exceed the maximum slenderness ratio for the concrete joists
- Insulation values do not increase proportionally (because of concrete joists), ask for calculated values.
- Option 1 on detail QD-108 is the most common choice using Type VIII [Type 1] EPS (>1.15 PCF density).

2 TECHNICAL & DESIGN

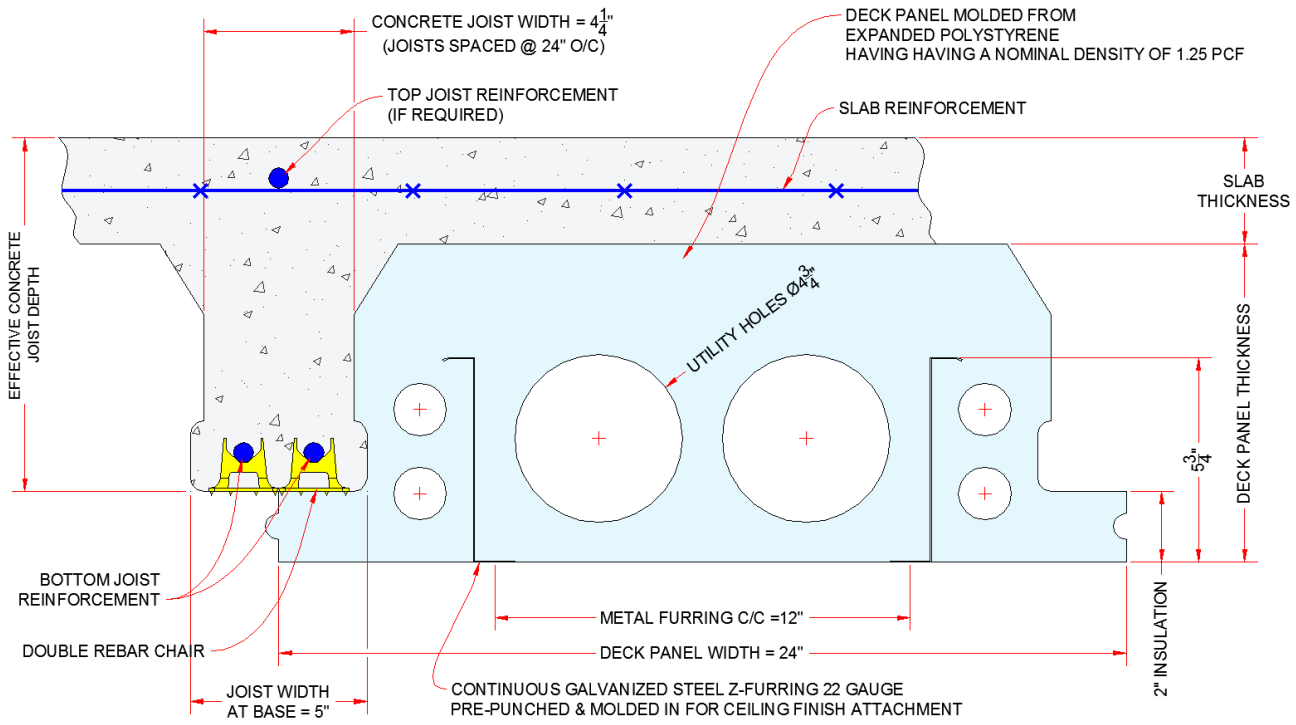
2.1 Functions of Quad-Deck Panels

Quad-Deck panels are steel-reinforced, expanded polystyrene insulation boards used as permanent, stay-in-place concrete formwork for cast-in-place floor and roof construction. Reinforced concrete joists are spaced at 24" [610mm] on center and poured monolithically with the slab to **form a one-way T-Beam reinforced concrete structure**.

Quad-Deck panels do not provide any permanent structural support. Structural support is provided by the reinforced concrete joists and slab topping only, which need to be designed by a licensed engineer in accordance with **ACI 318, ACI 301, NBCC, CAN/CSA A-23, and/or other applicable standards**. The "pan-form" Quad-Deck panels are available in several thicknesses / beam-depths to allow varying spans, loads, and insulation values of the one-way concrete slabs.

Each Quad-Deck panel is custom-cut to the exact length required and reinforced with two continuous, galvanized steel, Z-shaped metal ribs (22 gauge [0.8mm thickness]). The Z-shaped metal ribs serve as secondary shoring/formwork support and provide attachment points for ceiling finishes. Primary shoring must be designed and erected as per shoring supplier, project engineer, and/or applicable building codes (see below).

Note the 2" [51mm] insulation thickness below joists – e.g. **an 8"-thick panel creates a 6"-deep beam "joist".**



2.2 Design

T-Beam slabs must be designed per locally applicable codes such as ACI 318 (USA) and CAN/CSA A-23.3 in Canada.

- For estimating purposes, refer to **2.18 Quad-Deck Span Tables** for various spans & loads.
- Typical Detail drawings found in Appendix A: Quad-Deck Typical Details of this manual can also be downloaded in **DWG format at www.quadlock.com**
- **BIM files** in Revit® format are available at www.quadlock.com

IMPORTANT NOTE: Reinforced Concrete: The installer is responsible for placement of all reinforcing steel and concrete in accordance with, but not limited to, ACI (American Concrete Institute) 318 "Building Code Requirements for Structural Concrete", NBCC and/or CAN/CSA A23, and/or any other current applicable codes and regulations. Any variance from those standards must be provided and certified in advance by a structural engineer, licensed for the jobsite location and specifications.

2.3 Spans & Loads

Span capacity of Quad-Deck formed T-beam structures is dependent on various factors, such as live and dead loads, seismic, and/or other requirements assumed in the structural design. For budgeting and estimating purposes, refer to **2.18 Quad-Deck Span Tables** at end of this chapter.

Clear spans of up to 33 feet [10m] - measured from the centers of the supporting elements - can be accomplished for regular residential loads without modification to standard Quad-Deck profiles. Live and dead loads exceeding 100 psf (488kg/m^2) can be supported for shorter spans. Point loads ranging from 4000 to 8000 pounds (18 to 36 KN) are possible with adequate thickness of the slab.

Longer spans and/or higher loads may be achieved by increasing the T-beam height profile with **EPS Top Hats** secured to the top of Quad-Deck panels. See detail **QD-108** in Appendix A: Quad-Deck Typical Details.

Other options to increase span or load capacity include increasing the concrete compressive strength, additional reinforcing steel, shear stirrups, post tensioning, and/or camber. Contact Quad-Lock for details.

Cross ribs are sometimes required for spans that exceed 16'-0" [4.9m]. These are shallow concrete beams that act as blocking, similar to those used in wood-framed floors. Refer to detail **QD-312** in Appendix A: Quad-Deck Typical Details

2.4 Reinforcement

2.4.1 Reinforcement Sizing

Reinforcing requirements are largely a function of the desired span between supporting elements and the live loads imposed on the structure. The size, grade, and frequency of reinforcing bar should be determined by a licensed engineer for each project using national and local standards for concrete design.

- National standards include ACI 318 (USA) and CSA A-23.3 (Canada).
- For budgeting and estimating purposes, refer to 2.19 Quad-Deck Span Tables at end of this chapter.

2.4.2 Minimum Concrete Cover

Use minimum concrete cover as per ACI 318, CAN/CSA A-23.3, and/or other applicable codes. For example:

- Concrete for slabs, walls, joists not exposed to weather and not in contact with ground: ¾" [20mm]
- Concrete cast against and permanently exposed to earth: 3" [75mm]
- Concrete exposed to earth or weather, #6 [20M] and higher bars: 2" [50mm]; #5 [15M] bar, W31 or D31 [Ø16mm] wire, and smaller: 1½" [38mm]
- Fire rated concrete floors typically require a slightly greater cover. Refer to **ACI-216 Tables 2.3 to 2.6**.

2.4.3 Fiber Reinforcement

To improve shrinkage and crack control, steel fibers may be specified in accordance with building codes and manufacturers' requirements. They generally do not replace the primary reinforcement such as bottom joist reinforcing or shear reinforcement in the slab.

2.5 Slab Thickness

Due to the structural support provided by reinforced concrete joists spaced every 24 inches (610mm), a much thinner slab section is required than in traditional two-way slabs.

Slab sections between 2 and 5 inches (50 and 125mm) are commonly used, depending on live loads and other forces applied to the slab. **Residential slabs are often 3" thick**, garage floors with **high point loads are often 4-5" thick** and commercial slab thickness is sometimes dependant on the Fire Resistance Ratings required (see below).

Note that the slab thickness counts towards the **"effective beam depth", e.g. an 8"-thick Quad-Deck panel with a 3"-thick slab ontop creates a 9" effective beam height** (subtracting the 2" insulation thickness underneath joists).

Reduced slab thickness results in 30 to 40% concrete savings compared to conventional slab design, and therefore **eliminates 30 to 40% of the mass of the floor or roof**, see **2.9 Quad-Deck Floor Weights**. Reduced mass translates into lower accelerated loads when subjected to shock-loading, as well as requiring smaller supporting elements!

In-floor radiant heat tubing can be placed in the slab.

2.6 MEP Services

Quad-Deck assemblies are well suited to accommodate Mechanical, Electrical and Plumbing (MEP) utility services. For most horizontal service lines placed entirely within Quad-Deck formwork (not concrete), cuts into Quad-Deck panels are recommended only after sufficient concrete curing. CAUTION: Most cuts / alterations of Quad-Deck panels before the concrete pour require adequate remedies to safely carry all construction loads, such as complete lumber formwork underneath and/or additional shoring.

2.6.1 Penetrations through Concrete Joists and Slabs

The formed concrete, especially the joists, are critical structural components that must not be interrupted or otherwise weakened unless specifically approved by the EOR. It is recommended to **depict all penetrations and openings through any concrete of Quad-Deck assemblies on building plan documents**. ALWAYS ASK THE EOR, if there are any questions.

For vertical penetrations, try shifting all the concrete joists to one side or the other so the penetrations coincide with the center portions of panels, avoiding both the concrete joists and Quad-Deck's metal ribs. This can be easily done onsite by cutting a panel lengthwise and **starting that room's or area's layout with the reduced-width panel**. Cut off less than 4" [102mm], if possible (also try shifting the other direction), and never more than 11" [280mm] unless additional formwork and other remedies are provided to adequately support modified Quad-Deck panels and all construction loads.

Other options where a vertical sleeve (or pipe) coincides with a concrete joist are:

- **Cut Out Center Portion of a panel lengthwise** (reducing its width) near the conflict to shift one concrete joist closer to its neighbor so the penetration passes through the center portion of a nearby (unripped) panel. If both metal ribs of the Quad-Deck panel are unaffected, us EPS glue or sprayfoam to glue the ripped panel back together.
- With Caution - only if specifically approved by the EOR: Carve out an alternate, bow-shaped path (in plan view) in the Quad-Deck panels for the concrete joist to fit around the vertical penetration. See detail **QD-806** in Appendix A: Quad-Deck Typical Details. Alteration of Quad-Deck panels requires adequate remedies, such as lumber formwork underneath.

2.6.2 Mechanical

Many mechanical elements in residential construction can be placed in the floor assembly itself. When these elements are under 4.75" [120mm] in diameter and parallel to Quad-Deck, they can be easily installed in the void holes in the Quad-Deck panels. When service lines run perpendicular to Quad-Deck consider placing them in the bottom 2-inch insulation layer or into the slab prior to pour. Any lines interrupting the concrete must be carefully designed and approved by the EOR. If necessary, Quad-Deck panels can be completely removed to accommodate larger mechanical elements. A dropped ceiling can be used to accommodate larger air ducts and other elements, e.g. per methods common in commercial construction (wire attached to concrete carrying metal channels).

2.6.3 Electrical

Electrical wiring can be placed in the Quad-Deck 4.75" diameter holes when running parallel to Quad-Deck, or otherwise cutting chases into the EPS and metal ribs from the underside (after pour). The 2" thick EPS covering the concrete joists usually gives plenty of space to place the wiring. The electrical lines must be placed deep enough in the EPS to leave a min. 1.25" [32mm] clearance between the electrical line and the underside of Quad-Deck EPS surface. Gaps can be spray foamed, usually after building officials' inspection, to restore thermal properties.

2.6.4 Plumbing

Just like the mechanical services, light plumbing lines can be placed in the void tubes in Quad-Deck panels.

Sprinkler Lines

Sprinkler lines can be attached directly to the concrete joists by drilling in sleeve anchors through 2" [51mm] of EPS into the concrete joists. All-thread rod secured into a predrilled hole with a drop-in internally threaded expansion shell anchor must not interfere with reinforcing steel in the bottoms of the joists.

In-Floor Radiant Heat

In-floor radiant heat tubes can usually be placed directly in the slab on top of the Quad-Deck Panels or on top of the slab reinforcement - so long as the tubes do not co-align with the reinforcement bars.

2.7 Openings

Quad-Deck can accommodate floor and roof openings of many shapes and sizes, typically with monolithically poured beams around the opening.

Small Openings

Smaller openings less than 17" [431mm] wide and positioned between the concrete joists can often be added with minimal structural consideration. Remember to shift the joists left or right to correctly position the opening; and thicken the concrete edge or form a small beam inbetween joists by removing some EPS from the adjacent panels.

Medium Openings

Openings that span across a single concrete joist can be designed by transferring the load of that joist to the neighbouring joists using perpendicular beams. This allows for 43" [107cm] maximum width in line with Quad-Deck. See detail **QD-313** in Appendix A: Quad-Deck Typical Details.

Large Openings (Stairs)

Large openings must be supported on all sides by one of the following methods:

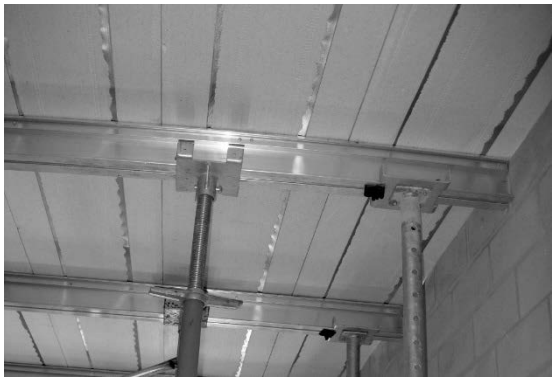
- Concrete Walls, ICF Walls or Concrete block Walls
- Steel or concrete beams, supported by steel or concrete columns as needed. Concrete beams are the more prevalent method due to their ease of installation using a monopour. See detail **QD-306**.
- Steel or concrete beams (without columns) that extend past the opening all the way to the exterior or interior load bearing walls/elements. This often requires dropped concrete or steel beams due to the loads that they have to carry. See details 2 on drawings **QD-304** and **QD-305** in Appendix A: Quad-Deck Typical Details.

Figure: Options for Openings in Quad-Deck Floors/Roofs.

In most cases, regular stud walls (metal or wood) are not suitable to support all the loads of concrete floors.

2.8 Shoring

2.8.1 Shoring System and Bearing



Refer to detail **QD-809** in Appendix A: Quad-Deck Typical Details. Quad-Deck panels must be supported by conventional primary shoring beams atop shoring posts or H-frames. In turn, posts or H-frames must bear on conventional base plates or similar to adequately distribute the loads from above.
If bearing on a concrete slab, the slab should be sufficient in thickness and age to bear loads from each leg of the shoring system. If bearing on soils or gravel, ground support must be provided for each leg in the form of double layers of dimension lumber (min. 2x10 [50mmx250mm]) or shoring pads.

2.8.2 Shoring Design

An **engineered shoring plan** must be part of the construction documents and is typically supplied by the shoring supplier (often included in the rental fee). Wood shoring may be utilized, but only if designed and inspected by a licensed engineer. **Primary shoring beams run perpendicular to Quad-Deck panels**, **starting no more than 6 inches [150mm] from Quad-Deck panel ends.** Secondary shoring (such as thick plywood reinforced with stringers) is only required under modified / weakened Quad-Deck panels, under conventionally formed concrete beams or similar elements. Shoring beams shall be **spaced at maximum 4-6 feet [1.2-1.8m] o/c for regular slabs (less than 5") and light construction loads**. For slabs 5" [125mm] and thicker or in conditions where construction loads are heavier than normal, shoring beams should be spaced at 4'-0" [1.2m] o/c or less. Shoring supports' **bearing width** (such as a shoring beam or top of a wider concrete wall) should be **at least 3 inches** [75mm]. Shoring columns or posts are typically spaced at 4-5 feet [1.2m-1.5m] o/c but is dependent on the types of beams & columns used and the tributary load that they supports from the shoring beam above. Do not rely on (ICF) wall formwork to support the weight of any construction loads (workers, concrete, rebar, etc.). See **2.9 Quad-Deck Floor Weights** below. Construction Loads, e.g. according to **ASCE 37-02,** range from 25 psf [1.2KN/m^2] for very light duty up to 75 psf [3.6KN/m^2] for very heavy duty.

The shoring installation must be inspected & approved prior to use & before placement of concrete.

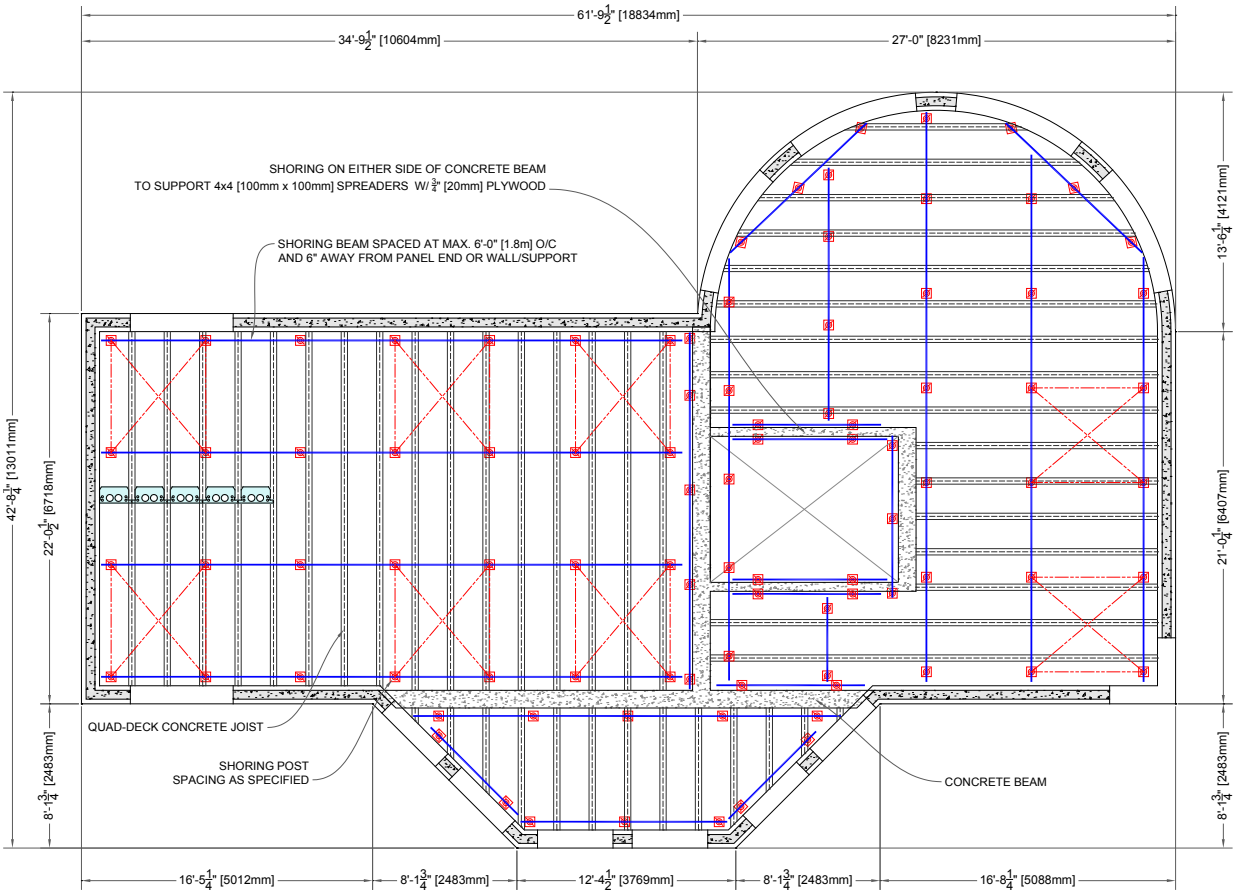


Figure: Typical Quad-Deck Shoring Plan

2.8.3 Shoring Removal

ACI 347, Section 3.7 provides guidelines pertaining to one-way floor slabs and the removal of shoring (and re-shoring) and can be followed in most circumstances. It is recommended to **always consult the EOR before shoring removal**. Most concrete is designed to reach its intended compressive strength in 28 days under normal conditions. The EOR may grant permission for **early removal of shoring** after verifying the concrete's strength based on core samples, calculations, environmental conditions, etc. A typical target is 75% or more of the design strength having been reached, which often happens within 14 days or less in good conditions.

2.8.4 Re-Shoring

NOTE: Re-shoring might not be an economical approach where only 2 or 3 levels are constructed due to the costs from additional engineering design, inspections, etc. For multilevel construction re-shoring may be economical, where SOME shoring beams and posts are removed - AFTER the concrete has reached sufficient strength - for re-use on the levels above. The un-shored spans (different from clear span as some of the shoring lines remain on the floors below) must support all the point loads and construction loads from above without harming the structure The time at which specific shoring members can be removed must be approved by the EOR (typically in consultation with the shoring designer).

2.9 Quad-Deck Floor Weights

Quad-Deck Floor Weights (lbs. /sq. ft.)							
Quad-Deck Panel Thickness	**Slab Thickness**						
	2"	**2.5"**	**3"**	**3.5"**	**4"**	**4.5"**	**5"**
7"	45.1	51.4	57.6	63.9	70.1	76.4	82.6
8"	47.3	53.6	59.8	66.1	72.3	78.6	84.8
9"	49.5	55.8	62.0	68.3	74.5	80.8	87.0
10"	51.7	58.0	64.2	70.5	76.7	83.0	89.2
11"	53.9	60.2	66.4	72.7	78.9	85.2	91.4
12"	56.2	62.5	68.7	75.0	81.2	87.5	93.7
12.5"	57.3	63.5	69.8	76.0	82.3	88.5	94.8

Note: The above are un-factored estimated weights which include concrete (150pcf), reinforcement (3 lbs. /sq. ft.), Quad-Deck Panel (2 lbs. /sq. ft.) and misc. (2 lbs. /sq. ft.)

Quad-Deck Floor Weights (Kg/m^2)							
Quad-Deck Panel Thickness	**Slab Thickness**						
	50mm	**75mm**	**90mm**	**100mm**	**110mm**	**120mm**	**130mm**
178mm	218.8	278.8	314.8	338.8	362.8	386.8	410.8
203mm	229.6	289.6	325.6	349.6	373.6	397.6	421.6
228mm	240.4	300.4	336.4	360.4	384.4	408.4	432.4
254mm	251.2	311.2	347.2	371.2	395.2	419.2	443.2
279mm	262.0	322.0	358.0	382.0	406.0	430.0	454.0
305mm	272.8	332.8	368.8	392.8	416.8	440.8	464.8
318mm	278.2	338.2	374.2	398.2	422.2	446.2	470.2

Note: The above are un-factored estimated weights which include concrete ($2400Kg/m^3$), reinforcement ($15Kg/m^2$), Quad-Deck Panel ($10Kg/m^2$) and misc. (10Kg/m2)

2.10 Concrete Usage

Cubic Yards (yd^3) of Concrete Mix per 1 square foot (ft^2) of Floor Area							
Quad-Deck Panel Thickness	**Slab Thickness**						
	2"	**2.5"**	**3"**	**3.5"**	**4"**	**4.5"**	**5"**
7"	0.009404	0.010948	0.012491	0.014034	0.015577	0.017121	0.018664
8"	0.009951	0.011494	0.013037	0.014581	0.016124	0.017667	0.019210
9"	0.010498	0.012041	0.013584	0.015127	0.016670	0.018214	0.019757
10"	0.011044	0.012587	0.014131	0.015674	0.017217	0.018760	0.020303
11"	0.011591	0.013134	0.014677	0.016220	0.017764	0.019307	0.020850
12"	0.012137	0.013680	0.015224	0.016767	0.018310	0.019853	0.021397
12.5"	0.012411	0.013954	0.015497	0.017040	0.018583	0.020127	0.021670

Example: 1000sqft floor constructed with 10" Quad-Deck and 3" slab would require (1000 x 0.014131) = 14.1cuyd of concrete mix.

Cubic Meters (m^3) of Concrete Mix per 1 square meter (m^2) of Floor Area							
Quad-Deck Panel Thickness	Slab Thickness						
	50mm	75mm	90mm	100mm	110mm	120mm	130mm
178mm	0.076595	0.101595	0.116595	0.126595	0.136595	0.146595	0.156595
203mm	0.081093	0.106093	0.121093	0.131093	0.141093	0.151093	0.161093
228mm	0.085591	0.110591	0.125591	0.135591	0.145591	0.155591	0.165591
254mm	0.090089	0.115089	0.130089	0.140089	0.150089	0.160089	0.170089
279mm	0.094587	0.119587	0.134587	0.144587	0.154587	0.164587	0.174587
305mm	0.099085	0.124085	0.139085	0.149085	0.159085	0.169085	0.179085
318mm	0.101334	0.126334	0.141334	0.151334	0.161334	0.171334	0.181334

Example: 100m^2 floor with 254mm Quad-Deck and 75mm slab would require (100 x 0.115089) = 11.5m^3 of concrete mix.

2.11 Fire Resistance Ratings

Actual Fire Resistance Ratings shall be determined by a licensed professional engineer. The below FRR are based on **IBC 2012 Section 722.2.2.1** "Reinforced and prestressed floors and roofs" and only consider the slab thickness:

Aggregate Type	Quad-Deck Slab Thickness for Fire Resistance Rating				
	1 hr.	**1.5** hr.	**2** hr.	**3** hr.	**4** hr.
Siliceous	3.5" [89mm]	4.3" [109mm]	5.0" [127mm]	6.2" [157mm]	7.0" [178mm]
Carbonate	3.2" [81mm]	4.0" [102mm]	4.6" [117mm]	5.7" [145mm]	6.6" [168mm]
Semi-lightweight	2.7" [69mm]	3.3" [84mm]	3.8" [97mm]	4.6" [117mm]	5.4" [137mm]
Lightweight	2.5" [64mm]	3.1" [79mm]	3.6" [91mm]	4.4" [112mm]	5.1" [130mm]

2.12 Flame Spread & Smoke Developed

Quad-Deck assemblies finished with regular ½" drywall have **passed NFPA 286 fire tests**. Most jurisdictions allow NFPA 286 results as specific approval in lieu of other fire-performance testing, e.g. under **IRC R316.6** in the USA.

NFPA 286-11 & ISO 9705:1993 12.5" Quad-Deck finished with 1/2 in. thick non-fire rated gypsum board fastened to Quad-Deck metal ribs with #6 x 1-5/8 in. self-tapping TEK screws spaced at 12 in. o.c. along length and width of the ceiling area, including the perimeters. **Findings**: "The Quad-Deck 12.5" Panel ICF System met the requirements of NFPA 286-11 and ISO 9705:1993, Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth." The gypsum board on the ceiling remained attached; no flashover occurred; no excessive smoke was generated; temperature rise was below prescribed maxima.

ASTM E84 / UL723: Quad-Deck EPS insulation boards have a Flame Spread Index < 25; and Smoke Developed Index < 450 (prior to floor ignition) per Preliminary Investigation Report by Underwriters Laboratory Inc. dated August 28, 2006.

2.13 EPS Board Type & Insulation Values

Quad-Deck is manufactured from expanded polystyrene ("EPS") at an average density of 1.25 PCF [20 kg/m3]. The EPS material is **Type VIII** in the US as per ASTM C578 and **Type 1 in Canada** as per CAN/ULC-S701. The EPS is treated with a flame-retardant for use in building insulation. In most design scenarios, building codes require that exposed foamed-plastic insulation be **covered with a minimum 15-minute rated thermal barrier**, such as ½" [13mm] gypsum drywall. The raw material vendor's evaluation and test reports, and any reports referenced below are available on request to building officials in your local jurisdiction.

2.13.1 Insulation Values

Calculated as per ASTM C578 (for compliance with US advertising laws), R-Value for Quad-Deck EPS is 3.8 per inch thickness @ 75°F. The **ASHRAE Handbook allows using higher and more accurate R-Values for EPS**, especially in cold conditions, in contrast to many other insulation materials that perform worse than advertised when heating or cooling is actually required. Calculated insulation values for Quad-Deck + concrete assemblies per ASTM C578 are:

Quad-Deck Panel Thickness	7" [178mm]	8" [203mm]	9" [228mm]	10" [254mm]	11" [279mm]	12" [305mm]	12.5" [318mm]
Assembly's Thermal Resistance R-Value (h•ft²•°F/BTU)	16	19	22	25	28	32	33
Assembly's Heat Transfer Co-efficient U-Value (W/m²•K)	0.35	0.3	0.26	0.23	0.20	0.18	0.17

2.13.2 Increasing the Insulation Values

Apart from using thicker Quad-Deck Panels for higher insulation values, the following methods are commonly used:

A. Place **EPS or similar insulation board on top of the Quad-Deck concrete slab** after the concrete has cured. This is typically done on roofs using tapered insulation for drainage and will often require a layer of protective board on top of the additional insulation. Refer to the supplier's technical documentation and CSI / CSC **Division 07 22 16 - Roof Board Insulation**

B. Fasten **EPS or similar insulation board to the underside of Quad-Deck** after shoring removal. Typically accomplished with commercially available Z-shaped metal channels attached perpendicular to Quad-Deck metal ribs as shown below, then finished underneath.

C. Place commercially available **insulating (cellular) concrete on top of Quad-Deck's (structural) concrete slab**, see CSI/CSC **Division 03 52 16 - Lightweight Insulating Concrete**

D. Use **EPS Top Hats** (also see **QD-108** in Appendix A: Quad-Deck Typical Details)

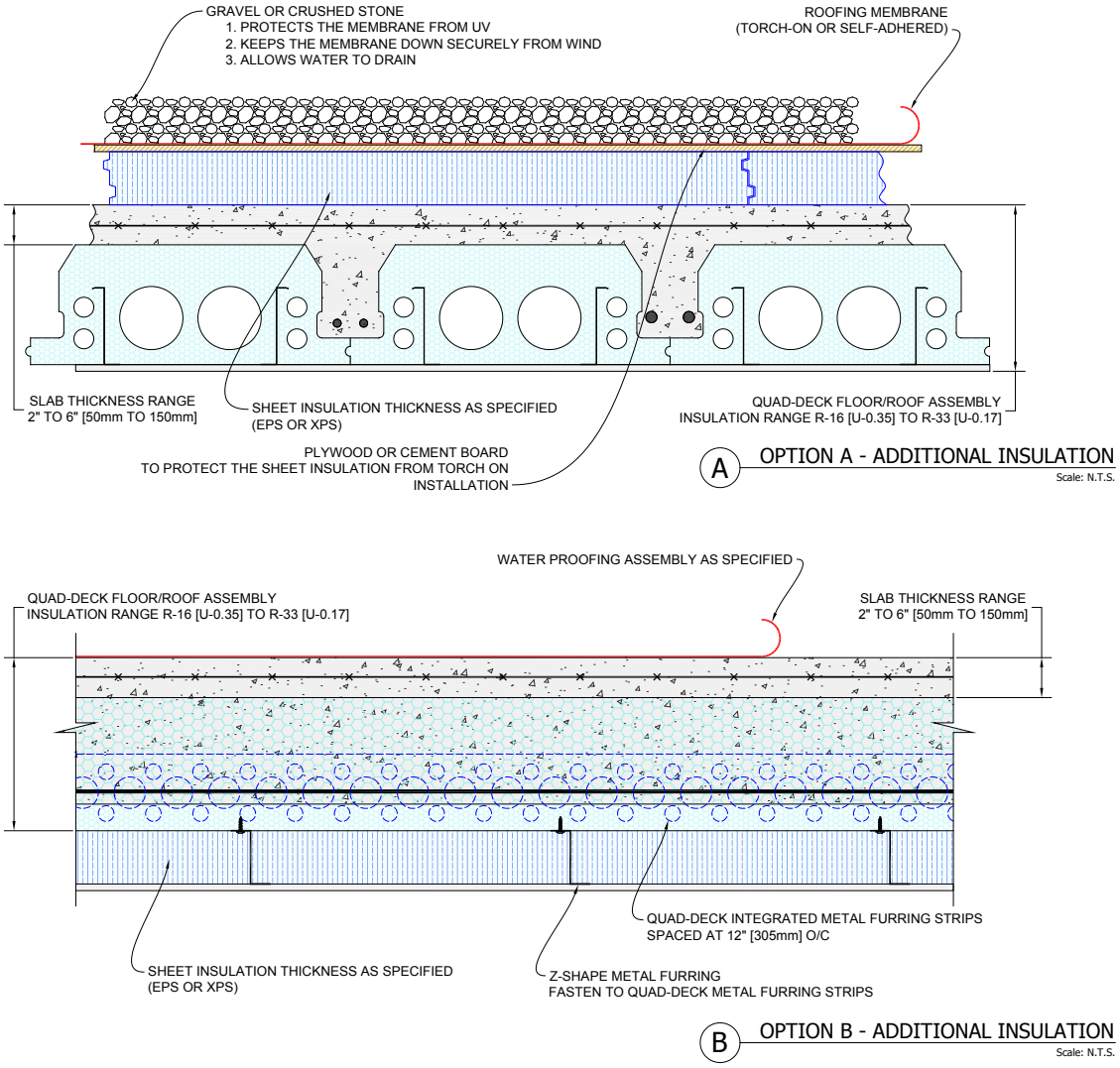


Figure: Additional Insulation Options A and B

2.14 Sound Attenuation Values

Quad-Deck floors have undergone sound transmission testing under ASTM E-90 (Airborne Sound) and ASTM E-1007 (Impact Insulation Class).

Results of Airborne Sound Transmission Loss Testing - ASTM E90 (Sound Transmission Classification)

Floor Type & Assembly	STC
16” [406mm] Floor Assembly (12” [305mm] Quad-Deck & 4” [102mm] Concrete) **Rubber Underlayment & Tile Flooring** and 1/2” [13mm] GWB ceiling finish	**55**
16” [406mm] Floor Assembly (12” [305mm] Quad-Deck & 4” [102mm] Concrete) **Rubber Underlayment & Wood Flooring** and 1/2” [13mm] GWB ceiling finish	**54**
12" [305mm] Floor Assembly (9” [228mm] Quad-Deck & 3” [75mm] Concrete) **2 layers 5/8" [16mm] gypsum board**	**53**
12" [305mm] Floor Assembly (9” [228mm] Quad-Deck & 3” [75mm] Concrete) 1 layer 5/8” [16mm] **gypsum board over resilient channel**	**50**
12" [305mm] Floor Assembly (9” [228mm] Quad-Deck & 3” [75mm] Concrete) **1 layer 5/8" [16mm] gypsum board**	**49**
12" [305mm] Floor Assembly (9” [228mm] Quad-Deck & 3” [75mm] Concrete) – **unfinished**	46

Results for Impact Sound Tests - ASTM E1007-04 and ASTM E492 (Field Impact Insulation Class)

Floor Type & Assembly	IIC
15” [381mm] Floor Assembly (12” [305mm] Quad-Deck & 3” [75mm] Concrete) **5/8" [16mm] Jute Carpet** on floor and 1/2” [13mm] GWB ceiling finish	**70**
16” [406mm] Floor Assembly (12” [305mm] Quad-Deck & 4” [102mm] Concrete) **Rubber Underlayment & Wood Flooring** and 1/2” [13mm] GWB ceiling finish	**52**
16” [406mm] Floor Assembly (12” [305mm] Quad-Deck & 4” [102mm] Concrete) **Rubber Underlayment & Tile Flooring** and 1/2” [13mm] GWB ceiling finish	**48**
15” [381mm] Floor Assembly (12” [305mm] Quad-Deck & 3” [75mm] Concrete) 2 Layers of 5/8” [16mm] Type X GWB ceiling finish	26
15” [381mm] Floor Assembly (12” [305mm] Quad-Deck & 3” [75mm] Concrete) 1/2” [13mm] tile on floor and 1/2” [13mm] GWB ceiling finish	26
15” [381mm] Floor Assembly (12” [305mm] Quad-Deck & 3” [75mm] Concrete) no finish on ceiling nor floor	17

2.15 Finishes

2.15.1 Ceiling finishes

Ceiling finishes (such as min. ½ in [13 mm] non fire rated GWB) can be attached directly to Quad-Deck’s continuous **metal ribs (22 gauge [0.85mm])**. The ribs are **spaced at 12" [305mm] o/c**. **Dropped ceilings** can be installed for projects requiring higher fire-resistance ratings or more room for HVAC or other utilities. Methods and products used in commercial construction are typically easy to add to Quad-Deck projects. Some jurisdictions may require a 15min thermal barrier on the underside of the Quad-Deck prior to installing a suspended ceiling.

2.15.2 Slab Joints

Quad-Lock recommends that the design of floor joints to be in accordance to **ACI 224.3R** and/or the applicable local code. The types of joints sometimes required are: Construction Joints, Contraction Joints, Isolation or Expansion Joints

2.15.3 Finishes On Garage Floors

Garage floors typically require 2% slope for drainage. This can be achieved by either tilting the entire floor assembly or by specifying a slab that changes thickness across the entire span of the floor. Refer to drawing **QD-802** in Appendix A: Quad-Deck Typical Detail Drawings. Garage floor finishes typically are a combination of the following:

- Crystalline water proofing admixture added to concrete, such as Kryton® or Xypex®.
- Surface sealant applied to concrete (only after concrete has fully cured and moisture has evaporated)
- Fibers to reduce risk of cracks

2.15.4 Finishes on Roofs

Quad-Deck roofs can accommodate virtually any finish system desired. For flat roofs a min.2% drain slope is usually required. Typical roof finishing methods are often **a combination of two or more** of the below:

- Crystalline water proofing admixture added to concrete, such as Kryton® or Xypex®
- Waterproofing membrane(s) placed directly on the concrete slab (either torch-on or self adhering) that are UV resistant or covered with UV resistant material
- Additional insulation board ontop of the assembly with protective board and waterproofing membrane(s)
- Insulating (Cellular) Concrete ontop of the concrete slab, finished per provider of insulating concrete, e.g. with waterproofing membrane(s)
- Surface sealant applied to concrete (only after concrete has fully cured and moisture has evaporated)
- Green Roof finish, see detail QD-503 in Appendix A: Quad-Deck Typical Details

For pitched roofs, furring can be added on top (first row placed in line with slope and cross furring on top) with tiles or panels on top

2.16 Suspending Items from Underside of Quad-Deck

Items can be suspended from underside of Quad-Deck in one of the following ways depending on weight and distribution. In all cases, plumbing or sprinkler equipment that is subject to shock loads must be securely fixed to Quad-Deck's concrete components with fasteners approved by the EOR.

2.16.1 Attaching Heavy Items

Heavy items (such as large iron water pipes) should be attached to the concrete joists in one of the following methods:

- **Preferred:** Before the pour, all-thread rods with nuts on top, hex-head bolts, or similar anchors can be inserted through the 2" of EPS into the concrete joists and cast-in-place, but avoiding conflict or interference with reinforcement bars.
- After the Quad-Deck assembly has been authorized for service by the EOR, remove small sections of EPS from underside of concrete T-beams to permit placement of drilled-in expansion anchors or bolts into concrete. Threaded rod can then be inserted into embedded anchors or coupled to expansion bolts. When drilling into the underside of T-beams, installer **must prevent damage to reinforcement embedded in the bottom of T-beams**. Best practice is to center Quad-Deck Double Rebar Chairs with two bars in bottoms of T-beams, and then drill between the double rebar strands – along the seam between Quad-Deck panels.

2.16.2 Attaching Light Items

Lighter items can be attached to the 22 gauge metal ribs integrated in the EPS Panels. A designer should consider the following:

- From data provided by the screw manufacturer, determine the withdrawal strength of the desired screws when placed in the 22 gauge galvanized sheet steel Z-strip. Calculate screw spacing to provide the appropriate loading for the material or device being attached to the Quad-Deck assembly.
- Testing has been performed to determine the pullout strength of Quad-Deck metal rib from EPS foam with the average ultimate failure result being 410 pounds [185kg] per linear foot of rib.

2.17 Special Design Considerations

2.17.1 Cantilevers

Quad-Deck cantilevers for overhangs and balconies can be safely designed for spans up to 10 feet [3m].

- See detail **QD-701** for conditions where Quad-Deck cantilevers in the direction of concrete joists
- See detail **QD-702** for conditions where Quad-Deck cantilever runs parallel to wall.

Special consideration must be given to:

- Thermal bridging between the concrete balcony and the interior floor. To avoid this consider either placing insulation on top of the balcony floor (see detail **QD-703**) or specifying a system that forms a thermal break between concrete floors and balconies such as Isokorb (see detail **QD-704**).

2.17.2 Pitched Roof Designs

Pitched Roofs are often designed with Quad-Deck to provide security against natural disasters. Designers should be aware of the lateral loads that the two opposing planes place on the walls. This can be addressed in one of two ways:

- Specifying horizontal struts to tie the two opposing walls. These struts can be steel angles or any other shape that is either welded to a steel plate with nelson studs cast in place or bolted to the concrete. In this case the ridge beam would not be required and panels would be simply mitered together.
- Specifying a ridge beam to carry the vertical loads of the two opposing planes thus preventing them for moving - this way the walls would only have to pick up the vertical loads from the roof planes. This ridge beam can be either steel or concrete with or without column supports depending on loads and span.

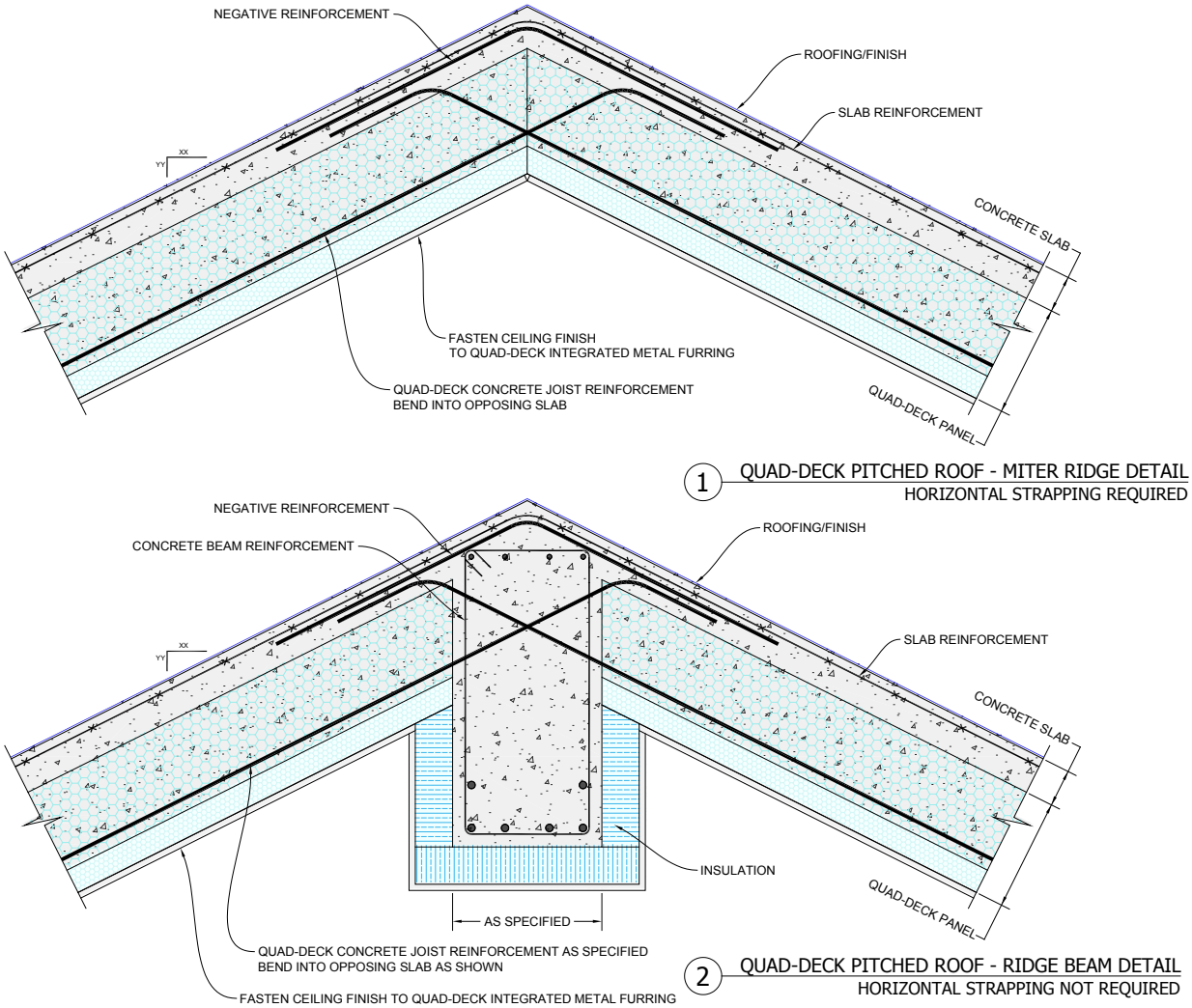


Figure: Quad-Deck options for pitched roof ridges.

2.17.3 Head Deflection

Like any floor or roof system, Quad-Deck is designed to deflect a small amount under maximum loads. This deflection may alter the finishes and partition walls attached from the underside. To alleviate this, we recommend that a head deflection track or equivalent method be specified on top of partition walls. This track can be fastened to Quad-Deck metal ribs or directly to the concrete joists. When the track is running parallel to Quad-Deck and in between the metal ribs, Quad-Lock recommends specifying metal or wood blocking/strapping embedded in the EPS panels that span between two neighboring concrete joists at no more than 24" [0.6m] o/c.

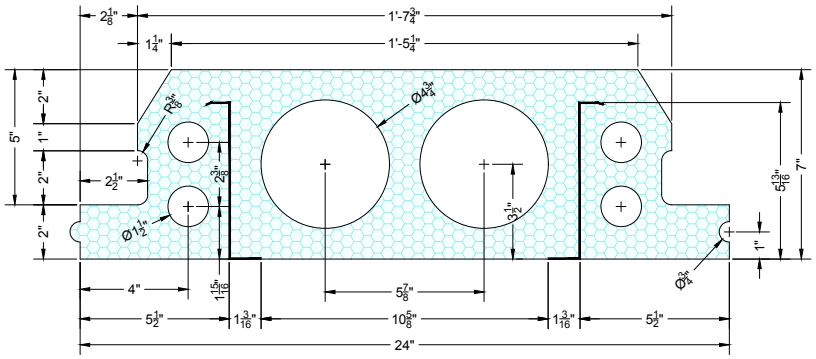
2.18 Quad-Deck Span Tables

The following tables have been developed for estimating purposes only.

2.18.1 Regular Floors & Roofs

7" QUAD-DECK PANEL

Maximum Spans with 4000psi Concrete Mix (2-#7 bottom & 1-#6 top rebar)			
Live Load	**Slab Thickness**		
	2"	**3"**	**4"**
20 psf	23'	25'	28'
40 psf	21'	23'	26'
100 psf	12'	14'	15'



7" QUAD-DECK PANEL

2" SLAB (Based on 3000psi concrete, higher psi concrete can increase span)

Live Load	Maximum Span (feet)													
	10	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**
20 psf	1-#4	1-#4	1-#4	1-#4	1-#4	1-#4	1-#6	2-#5	2-#6					
40 psf	1-#4	1-#4	1-#4	1-#4	1-#5	1-#6	2-#5	2-#6						
100 psf	1-#4	1-#4	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍

⎍ 100 psf live load span can be increased by adding stirrups.

3" SLAB (Based on 3000psi concrete, higher psi concrete can increase span)

Live Load	Maximum Span (feet)													
	10	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**
20 psf	1-#4	1-#4	1-#4	1-#4	1-#4	1-#4	1-#5	2-#5	2-#5	2-#6	2-#6			
40 psf	1-#4	1-#4	1-#4	1-#4	1-#5	1-#5	2-#5	2-#5	2-#6	2-#6				
100 psf	1-#4	1-#5	1-#5	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍

⎍ 100 psf live load span can be increased by adding stirrups.

4" SLAB (Based on 3000psi concrete, higher psi concrete can increase span)

Live Load	Maximum Span (feet)													
	10	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**
20 psf	1-#4	1-#4	1-#4	1-#4	1-#4	1-#4	1-#5	1-#5	1-#5	1-#5	1-#6	1-#6	2-#6	
40 psf	1-#4	1-#4	1-#4	1-#4	1-#5	1-#5	1-#5	1-#5	1-#6	1-#6	1-#6	2-#6		
100 psf	1-#4	1-#5	1-#5	1-#5	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍

⎍ 100 psf live load span can be increased by adding stirrups.

Slab Thickness	**2"**	**3"**	**4"**	**5"**
R-value (h•ft²•°F/BTU)	16	16	16	16
Sq. ft. of floor covered by 1 cuyd of concrete[A]	106	80	64	53
Floor Weight (psf)[B]	46	58	71	83
Fire Resistance Rating (as per ACI 216)			1 hr.	2 hr.

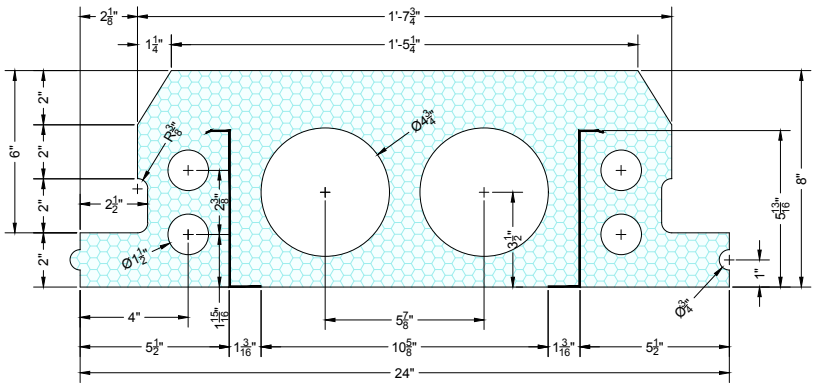
NOTES:

A. To calculate cubic yardage, divide the total square footage of Quad-Deck by the number shown in the chart.
B. These estimated weights include the combined weight of Quad-Deck panel, concrete, rebar, and miscellaneous.
C. These tables are for estimating purposes only, not for construction. The final design of a concrete structure must be completed by a licensed professional engineer.

Common Conversion Factors		
1 psf	=	4.88 Kg/m^2
1 inch	=	25.4 mm
1 foot	=	305 mm
1 sqft	=	0.0929 m^2
1 cuyd	=	0.765 m^3
1-#4	=	15M
1-#6	=	20M

8" QUAD-DECK PANEL

Maximum Spans with 4000psi Concrete Mix (2-#7 bottom & 1-#6 top rebar)			
Live Load	**Slab Thickness**		
	2"	**3"**	**4"**
20 psf	25'	27'	29'
40 psf	23'	25'	25'
100 psf	14'	15'	16'



8" QUAD-DECK PANEL

2" SLAB (Based on 3000psi concrete, higher psi concrete can increase span)

Live Load	Maximum Span (feet)													
	11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
20 psf	1-#4	1-#4	1-#4	1-#4	1-#4	1-#4	1-#5	2-#5	2-#5	2-#6	2-#6			
40 psf	1-#4	1-#4	1-#4	1-#4	1-#5	1-#6	2-#5	2-#5	2-#6					
100 psf	1-#5	1-#5	⩘	⩘	⩘	⩘	⩘	⩘	⩘	⩘	⩘	⩘	⩘	⩘

⩘ 100 psf live load span can be increased by adding stirrups.

3" SLAB (Based on 3000psi concrete, higher psi concrete can increase span)

Live Load	Maximum Span (feet)													
	11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
20 psf	1-#4	1-#4	1-#4	1-#4	1-#4	1-#4	1-#5	1-#5	1-#6	2-#5	2-#6	2-#6		
40 psf	1-#4	1-#4	1-#4	1-#4	1-#5	1-#5	1-#5	1-#6	2-#6	2-#6				
100 psf	1-#4	1-#5	1-#5	⩘	⩘	⩘	⩘	⩘	⩘	⩘	⩘	⩘	⩘	⩘

⩘ 100 psf live load span can be increased by adding stirrups.

4" SLAB (Based on 3000psi concrete, higher psi concrete can increase span)

Live Load	Maximum Span (feet)													
	11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
20 psf	1-#4	1-#4	1-#4	1-#4	1-#4	1-#4	1-#5	1-#5	1-#5	1-#5	2-#6	2-#6	2-#6	2-#6
40 psf	1-#4	1-#4	1-#4	1-#4	1-#5	1-#5	1-#5	1-#5	1-#6	1-#6	2-#6	2-#6		
100 psf	1-#4	1-#5	1-#5	1-#5	⩘	⩘	⩘	⩘	⩘	⩘	⩘	⩘	⩘	⩘

⩘ 100 psf live load span can be increased by adding stirrups.

Slab Thickness	**2"**	**3"**	**4"**	**5"**
R-value (h•ft²•°F/BTU)	19	19	19	19
Sq. ft. of floor covered by 1 cuyd of concrete[A]	100	77	62	52
Floor Weight (psf)[B]	48	60	73	85
Fire Resistance Rating (as per ACI 216)			1 hr.	2 hr.

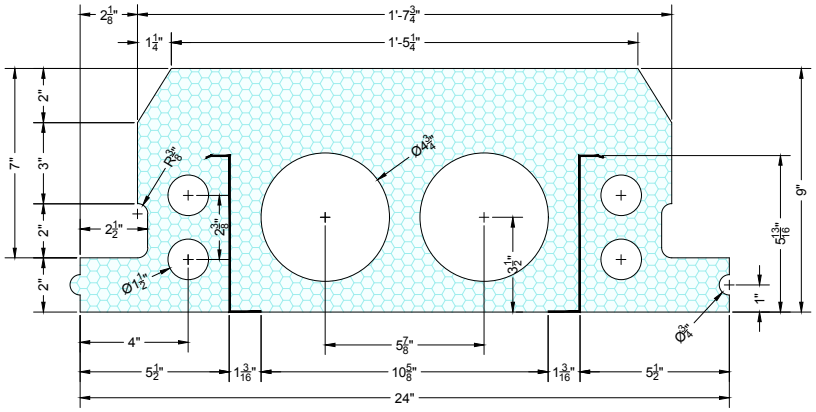
Common Conversion Factors		
1 psf	=	4.88 Kg/m^2
1 inch	=	25.4 mm
1 foot	=	305 mm
1 sqft	=	0.0929 m^2
1 cuyd	=	0.765 m^3
1-#4	=	15M
1-#6	=	20M

NOTES:

A. To calculate cubic yardage, divide the total square footage of Quad-Deck by the number shown in the chart.
B. These estimated weights include the combined weight of Quad-Deck panel, concrete, rebar, and miscellaneous.
C. These tables are for estimating purposes only, not for construction. The final design of a concrete structure must be completed by a licensed professional engineer.

9" QUAD-DECK PANEL

Maximum Spans with 4000psi Concrete Mix (2-#7 bottom & 1-#6 top rebar)			
Live Load	**Slab Thickness**		
	2"	**3"**	**4"**
20 psf	27'	29'	30'
40 psf	25'	26'	28'
100 psf	16'	17'	17'



9" QUAD-DECK PANEL

2" SLAB (Based on 3000psi concrete, higher psi concrete can increase span)

Live Load	Maximum Span (feet)													
	12	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**
20 psf	1-#4	1-#4	1-#4	1-#4	1-#4	1-#4	1-#5	1-#6	2-#5	2-#5	2-#6			
40 psf	1-#4	1-#4	1-#4	1-#4	1-#5	1-#5	1-#6	2-#5	2-#6					
100 psf	1-#5	1-#5	1-#6	⏦	⏦	⏦	⏦	⏦	⏦	⏦	⏦	⏦	⏦	⏦

⏦ 100 psf live load span can be increased by adding stirrups.

3" SLAB (Based on 3000psi concrete, higher psi concrete can increase span)

Live Load	Maximum Span (feet)													
	12	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**
20 psf	1-#4	1-#4	1-#4	1-#4	1-#4	1-#4	1-#5	1-#5	1-#5	1-#6	2-#6	2-#6		
40 psf	1-#4	1-#4	1-#4	1-#5	1-#5	1-#5	1-#5	1-#6	2-#5	2-#6	2-#6			
100 psf	1-#5	1-#5	1-#5	1-#6	⏦	⏦	⏦	⏦	⏦	⏦	⏦	⏦	⏦	⏦

⏦ 100 psf live load span can be increased by adding stirrups.

4" SLAB (Based on 3000psi concrete, higher psi concrete can increase span)

Live Load	Maximum Span (feet)													
	12	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**
20 psf	1-#4	1-#4	1-#4	1-#4	1-#4	1-#4	1-#5	1-#5	1-#5	1-#5	1-#6	1-#6	1-#6	2-#6
40 psf	1-#4	1-#4	1-#4	1-#4	1-#5	1-#5	1-#5	1-#6	1-#6	1-#6	1-#6	2-#6	2-#6	
100 psf	1-#5	1-#5	1-#5	1-#5	1-#6	⏦	⏦	⏦	⏦	⏦	⏦	⏦	⏦	⏦

⏦ 100 psf live load span can be increased by adding stirrups.

Slab Thickness	**2"**	**3"**	**4"**	**5"**
R-value (h•ft²•°F/BTU)	22	22	22	22
Sq. ft. of floor covered by 1 cuyd of concrete[A]	95	73	60	51
Floor Weight (psf)[B]	50	63	75	88
Fire Resistance Rating (as per ACI 216)			1 hr.	2 hr.

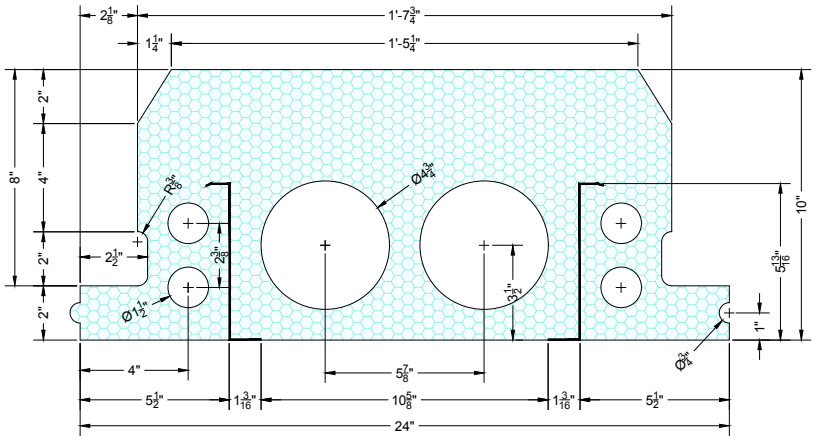
Common Conversion Factors		
1 psf	=	4.88 Kg/m^2
1 inch	=	25.4 mm
1 foot	=	305 mm
1 sqft	=	0.0929 m^2
1 cuyd	=	0.765 m^3
1-#4	=	15M
1-#6	=	20M

NOTES:

A. To calculate cubic yardage, divide the total square footage of Quad-Deck by the number shown in the chart.
B. These estimated weights include the combined weight of Quad-Deck panel, concrete, rebar, and miscellaneous.
C. These tables are for estimating purposes only, not for construction. The final design of a concrete structure must be completed by a licensed professional engineer.

10" QUAD-DECK PANEL

Maximum Spans with 4000psi Concrete Mix (2-#7 bottom & 1-#6 top rebar)			
Live Load	**Slab Thickness**		
	2"	**3"**	**4"**
20 psf	29'	30'	32'
40 psf	27'	28'	30'
100 psf	18'	19'	20'



10" QUAD-DECK PANEL

2" SLAB (Based on 3000psi concrete, higher psi concrete can increase span)

Live Load	Maximum Span (feet)													
	13	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**
20 psf	1-#4	1-#4	1-#4	1-#4	1-#4	1-#4	1-#5	1-#5	1-#6	2-#5	2-#5	2-#6		
40 psf	1-#4	1-#4	1-#4	1-#4	1-#5	1-#5	1-#5	1-#6	2-#5	2-#6				
100 psf	1-#5	1-#5	1-#5	1-#6	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍

⎍ 100 psf live load span can be increased by adding stirrups.

3" SLAB (Based on 3000psi concrete, higher psi concrete can increase span)

Live Load	Maximum Span (feet)													
	13	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**
20 psf	1-#4	1-#4	1-#4	1-#4	1-#4	1-#4	1-#5	1-#5	1-#5	1-#6	2-#6	2-#6	2-#6	
40 psf	1-#4	1-#4	1-#4	1-#4	1-#4	1-#4	1-#5	1-#6	2-#5	2-#6	2-#6			
100 psf	1-#5	1-#5	1-#5	1-#6	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍

⎍ 100 psf live load span can be increased by adding stirrups.

4" SLAB (Based on 3000psi concrete, higher psi concrete can increase span)

Live Load	Maximum Span (feet)													
	13	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**
20 psf	1-#4	1-#4	1-#4	1-#5	1-#5	1-#5	1-#5	1-#5	1-#5	1-#5	1-#6	2-#6	2-#6	2-#6
40 psf	1-#4	1-#5	1-#5	1-#5	1-#5	1-#5	1-#5	1-#6	1-#6	1-#6	2-#6	2-#6	2-#6	
100 psf	1-#5	1-#5	1-#5	1-#6	1-#6	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍

⎍ 100 psf live load span can be increased by adding stirrups.

Slab Thickness	**2"**	**3"**	**4"**	**5"**
R-value (h•ft²•°F/BTU)	25	25	25	25
Sq. ft. of floor covered by 1 cuyd of concrete[A]	90	71	58	49
Floor Weight (psf)[B]	52	65	77	90
Fire Resistance Rating (as per ACI 216)			1 hr.	2 hr.

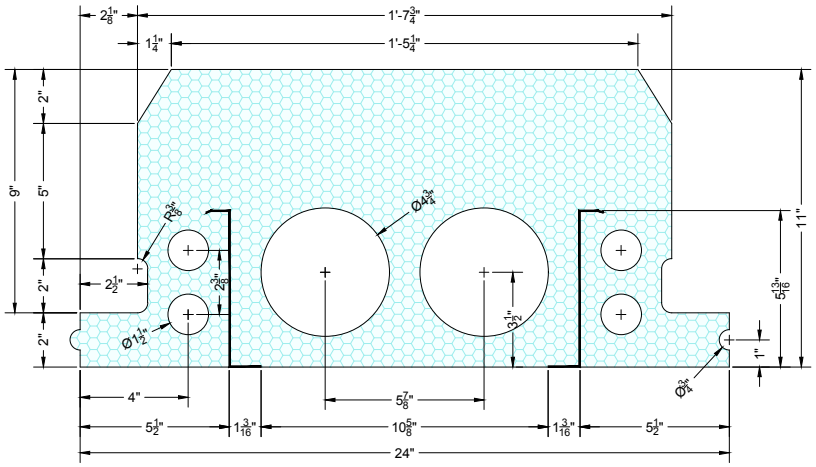
Common Conversion Factors		
1 psf	=	4.88 Kg/m^2
1 inch	=	25.4 mm
1 foot	=	305 mm
1 sqft	=	0.0929 m^2
1 cuyd	=	0.765 m^3
1-#4	=	15M
1-#6	=	20M

NOTES:

A. To calculate cubic yardage, divide the total square footage of Quad-Deck by the number shown in the chart.
B. These estimated weights include the combined weight of Quad-Deck panel, concrete, rebar, and miscellaneous.
C. These tables are for estimating purposes only, not for construction. The final design of a concrete structure must be completed by a licensed professional engineer.

11" QUAD-DECK PANEL

Maximum Spans with 4000psi Concrete Mix (2-#7 bottom & 1-#6 top rebar)			
Live Load	**Slab Thickness**		
	2"	**3"**	**4"**
20 psf	30'	32'	32'
40 psf	28'	29'	31'
100 psf	20'	20'	21'



11" QUAD-DECK PANEL

2" SLAB (Based on 3000psi concrete, higher psi concrete can increase span)

Live Load	Maximum Span (feet)													
	14	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**
20 psf	1-#4	1-#4	1-#4	1-#4	1-#4	1-#4	1-#5	1-#5	1-#6	2-#5	2-#5	2-#6		
40 psf	1-#4	1-#4	1-#4	1-#4	1-#4	1-#4	1-#5	1-#6	2-#5	2-#6	2-#6			
100 psf	1-#5	1-#5	1-#6	1-#6	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍

⎍ 100 psf live load span can be increased by adding stirrups.

3" SLAB (Based on 3000psi concrete, higher psi concrete can increase span)

Live Load	Maximum Span (feet)													
	14	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**
20 psf	1-#4	1-#4	1-#4	1-#5	1-#5	1-#5	1-#5	1-#5	1-#5	1-#6	2-#5	2-#6	2-#6	
40 psf	1-#4	1-#5	1-#5	1-#5	1-#5	1-#5	1-#5	1-#6	1-#6	2-#5	2-#6	2-#6		
100 psf	1-#5	1-#5	1-#6	1-#6	1-#6	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍

⎍ 100 psf live load span can be increased by adding stirrups.

4" SLAB (Based on 3000psi concrete, higher psi concrete can increase span)

Live Load	Maximum Span (feet)													
	14	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**
20 psf	1-#4	1-#4	1-#5	1-#5	1-#5	1-#5	1-#5	1-#5	1-#5	1-#5	1-#6	2-#6	2-#6	2-#6
40 psf	1-#4	1-#5	1-#5	1-#5	1-#5	1-#5	1-#5	1-#6	1-#6	1-#6	2-#6	2-#6	2-#6	
100 psf	1-#5	1-#5	1-#5	1-#6	1-#6	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍

⎍ 100 psf live load span can be increased by adding stirrups.

Slab Thickness	**2"**	**3"**	**4"**	**5"**
R-value (h•ft²•°F/BTU)	28	28	28	28
Sq. ft. of floor covered by 1 cuyd of concrete[A]	86	68	56	48
Floor Weight (psf)[B]	54	67	79	92
Fire Resistance Rating (as per ACI 216)			1 hr.	2 hr.

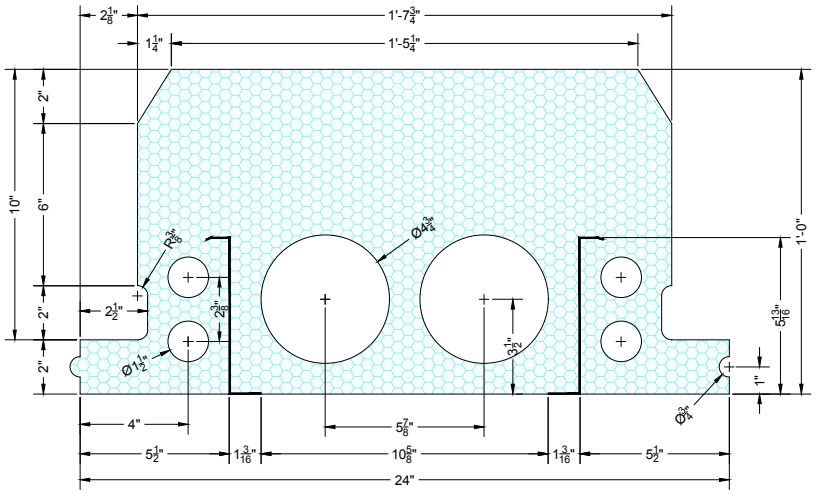
Common Conversion Factors		
1 psf	=	4.88 Kg/m^2
1 inch	=	25.4 mm
1 foot	=	305 mm
1 sqft	=	0.0929 m^2
1 cuyd	=	0.765 m^3
1-#4	=	15M
1-#6	=	20M

NOTES:

A. To calculate cubic yardage, divide the total square footage of Quad-Deck by the number shown in the chart.
B. These estimated weights include the combined weight of Quad-Deck panel, concrete, rebar, and miscellaneous.
C. These tables are for estimating purposes only, not for construction. The final design of a concrete structure must be completed by a licensed professional engineer.

12" QUAD-DECK PANEL

Maximum Spans with 4000psi Concrete Mix (2-#7 bottom & 1-#6 top rebar)			
Live Load	**Slab Thickness**		
	2"	**3"**	**4"**
20 psf	32'	33'	34'
40 psf	30'	31'	32'
100 psf	21'	22'	22'



12" QUAD-DECK PANEL

2" SLAB (Based on 3000psi concrete, higher psi concrete can increase span)

Live Load	Maximum Span (feet)													
	16	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**
20 psf	1-#4	1-#4	1-#5	1-#5	1-#5	1-#5	1-#5	1-#5	1-#6	2-#5	2-#6	2-#6		
40 psf	1-#4	1-#4	1-#5	1-#5	1-#5	1-#5	1-#6	2-#5	2-#5	2-#6				
100 psf	1-#5	1-#6	1-#6	1-#6	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍

⎍ 100 psf live load span can be increased by adding stirrups.

3" SLAB (Based on 3000psi concrete, higher psi concrete can increase span)

Live Load	Maximum Span (feet)													
	16	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**
20 psf	1-#4	1-#5	1-#5	1-#5	1-#5	1-#5	1-#5	1-#5	1-#5	2-#6	2-#6	2-#6		
40 psf	1-#4	1-#5	1-#5	1-#5	1-#5	1-#5	1-#6	1-#6	2-#5	2-#6	2-#6			
100 psf	1-#6	1-#6	1-#6	1-#6	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍

⎍ 100 psf live load span can be increased by adding stirrups.

4" SLAB (Based on 3000psi concrete, higher psi concrete can increase span)

Live Load	Maximum Span (feet)													
	16	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**
20 psf	1-#4	1-#5	1-#5	1-#5	1-#5	1-#5	1-#5	1-#5	1-#6	1-#6	2-#6	2-#6	2-#6	2-#6
40 psf	1-#5	1-#5	1-#5	1-#5	1-#5	1-#5	1-#6	1-#6	1-#6	2-#6	2-#6	2-#6		
100 psf	1-#5	1-#6	1-#6	1-#6	1-#6	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍

⎍ 100 psf live load span can be increased by adding stirrups.

Slab Thickness	**2"**	**3"**	**4"**	**5"**
R-value (h•ft²•°F/BTU)	32	32	32	32
Sq. ft. of floor covered by 1 cuyd of concrete[A]	82	66	55	47
Floor Weight (psf)[B]	57	69	82	94
Fire Resistance Rating (as per ACI 216)			1 hr.	2 hr.

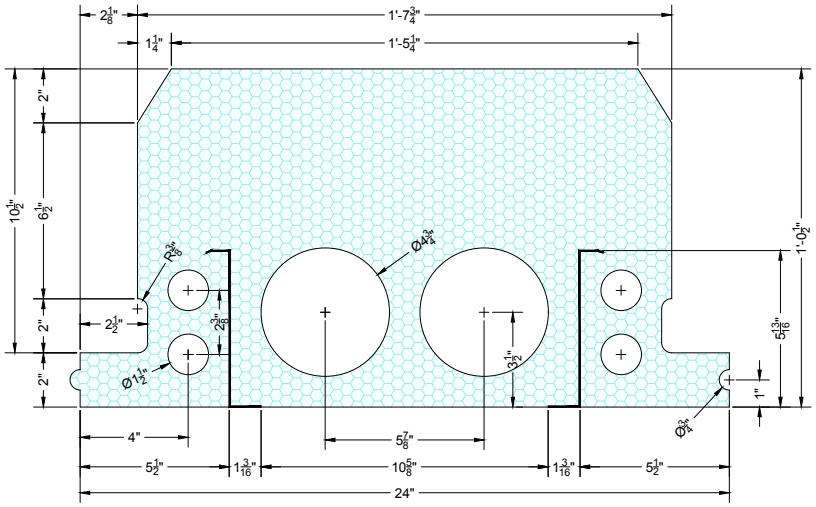
Common Conversion Factors		
1 psf	=	4.88 Kg/m^2
1 inch	=	25.4 mm
1 foot	=	305 mm
1 sqft	=	0.0929 m^2
1 cuyd	=	0.765 m^3
1-#4	=	15M
1-#6	=	20M

NOTES:

A. To calculate cubic yardage, divide the total square footage of Quad-Deck by the number shown in the chart.
B. These estimated weights include the combined weight of Quad-Deck panel, concrete, rebar, and miscellaneous.
C. These tables are for estimating purposes only, not for construction. The final design of a concrete structure must be completed by a licensed professional engineer.

12.5" QUAD-DECK PANEL

Maximum Spans with 4000psi Concrete Mix (2-#7 bottom & 1-#6 top rebar)			
Live Load	**Slab Thickness**		
	2"	**3"**	**4"**
20 psf	33'	33'	35'
40 psf	31'	31'	33'
100 psf	22'	22'	23'



12.5" QUAD-DECK PANEL

2" SLAB (Based on 3000psi concrete, higher psi concrete can increase span)

Live Load	Maximum Span (feet)													
	17	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
20 psf	1-#4	1-#5	1-#5	1-#5	1-#5	1-#5	1-#5	1-#5	1-#6	2-#5	2-#6	2-#6		
40 psf	1-#5	1-#5	1-#5	1-#5	1-#5	1-#5	1-#6	2-#5	2-#6	2-#6				
100 psf	1-#6	1-#6	1-#6	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍

⎍ 100 psf live load span can be increased by adding stirrups.

3" SLAB (Based on 3000psi concrete, higher psi concrete can increase span)

Live Load	Maximum Span (feet)													
	17	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
20 psf	1-#5	1-#5	1-#5	1-#5	1-#5	1-#6	1-#6	1-#6	1-#6	2-#5	2-#6	2-#6		
40 psf	1-#5	1-#5	1-#5	1-#5	1-#5	1-#6	1-#6	2-#5	2-#6	2-#6	2-#6			
100 psf	1-#5	1-#6	1-#6	1-#6	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍

⎍ 100 psf live load span can be increased by adding stirrups.

4" SLAB (Based on 3000psi concrete, higher psi concrete can increase span)

Live Load	Maximum Span (feet)													
	17	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
20 psf	1-#5	1-#5	1-#5	1-#5	1-#5	1-#5	1-#5	1-#5	1-#6	1-#6	2-#6	2-#6	2-#6	2-#6
40 psf	1-#5	1-#5	1-#5	1-#5	1-#5	1-#6	1-#6	1-#6	1-#6	1-#6	2-#6	2-#6		
100 psf	1-#5	1-#6	1-#6	1-#6	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍	⎍

⎍ 100 psf live load span can be increased by adding stirrups.

Slab Thickness	**2"**	**3"**	**4"**	**5"**
R-value (h•ft²•°F/BTU)	33	33	33	33
Sq. ft. of floor covered by 1 cuyd of concrete[A]	80	64	54	46
Floor Weight (psf)[B]	58	70	83	95
Fire Resistance Rating (as per ACI 216)			1 hr.	2 hr.

Common Conversion Factors		
1 psf	=	4.88 Kg/m^2
1 inch	=	25.4 mm
1 foot	=	305 mm
1 sqft	=	0.0929 m^2
1 cuyd	=	0.765 m^3
1-#4	=	15M
1-#6	=	20M

NOTES:

A. To calculate cubic yardage, divide the total square footage of Quad-Deck by the number shown in the chart.
B. These estimated weights include the combined weight of Quad-Deck panel, concrete, rebar, and miscellaneous.
C. These tables are for estimating purposes only, not for construction. The final design of a concrete structure must be completed by a licensed professional engineer.

2.18.2 Garage Floors

All cases below require:

5000 psi Concrete Mix

5"-thick Concrete Slab Reinforced with #3 @ 12" O/C Each Way.

#4 Perimeter Dowels: 24" into wall and 48" into slab spaced at 24" o/c on all sides.

Load	Span (feet) 16	18	20	22	24	26
USA 3000 lbs point load or 40psf Live Load	8" Thick Panel 2-#5 Bottom Rebar. Stirrups not required.	9" Thick Panel 2-#6 Bottom Rebar. Stirrups not required.	10" Thick Panel 2-#6 Bottom Rebar. #3 Stirrups @ 5" o/c. Required for full length of each rib.	11" Thick Panel 2-#6 Bottom Rebar. #3 Stirrups @ 6" o/c. Required for full length of each rib.	12" Thick Panel 2-#6 Bottom Rebar. #3 Stirrups @ 6" o/c. Required for first and last 8 feet of each rib.	12.5" Thick Panel 2-#7 Bottom Rebar. #3 Stirrups @ 7" o/c. Required for first and last 9 feet of
Canada 4000 lbs point load and 50psf Live Load	10" Thick Panel 2-#6 Bottom Rebar #3 Stirrups @ 5" o/c. Required for full length of each rib.	12" Thick Panel 2-#6 Bottom Rebar #3 Stirrups @ 6" o/c. Required for full length of each rib.	12" Thick Panel 1-#8 & 1-#6 Bottom Rebar #3 Stirrups @ 6" o/c. Required for full length of each rib.	12.5" Thick Panel 1-#8 & 1-#6 Bottom Rebar #3 Stirrups @ 7" o/c. Required for full length of each rib.	12.5" Thick Panel 2-#8 Bottom Rebar #3 Stirrups @ 7" o/c. Required for full length of each rib.	12.5" Thick Panel 2-#8 Bottom Rebar #3 Stirrups @ 7" o/c. Required for full length of each rib.

NOTE

These tables are for estimating purposes only, not for construction. The final design of a concrete structure must be completed by a licensed professional engineer.

2.18.3 Intensive Green Roofs

All cases below require:

3000 psi Concrete Mix

3.5"-thick Concrete Slab Reinforced with 6x6 WWM 2.9 gauge

#4 Perimeter Dowels: 24" into wall and 48" into slab spaced at 24" o/c on all sides

Load	Span (feet) 16	18	20	22	24	26
150 psf	7" thick Panel 2-#6 Bottom Rebar #3 Stirrups @ 3" o/c. Required for first and last 4 feet of each rib.	9" Thick Panel 2-#6 Bottom Rebar #3 Stirrups @ 4" o/c. Required for first and last 7 feet of each rib.	11" Thick Panel 2-#6 Bottom Rebar #3 Stirrups @ 5" o/c. Required for first and last 7 feet of each rib.	10" Thick Panel 2-#7 Bottom Rebar #3 Stirrups @ 6" o/c. Required for first and last 9 feet of each rib.	12" Thick Panel 2-#7 Bottom Rebar #3 Stirrups @ 6" o/c. Required for first and last 9 feet of each rib.	12" Thick Panel 2-#8 Bottom Rebar #3 Stirrups @ 6" o/c. Required for first and last 10 feet of each rib.
250 psf	11" Thick Panel 2-#6 Bottom Rebar #3 Stirrups @ 5" o/c. Required for first and last 6 feet of each rib.	12.5" Thick Panel 2-#6 Bottom Rebar #3 Stirrups @ 6" o/c. Required for first and last 7 feet of each rib.	12.5" Thick Panel 2-#7 Bottom Rebar #3 Stirrups @ 6" o/c. Required for first and last 8 feet of each rib.	12.5" Thick Panel 2-#8 Bottom Rebar #3 Stirrups @ 6" o/c. Required for first and last 9 feet of each rib.	12.5" Thick Panel 2" Top Hat 2-#8 Bottom Rebar #3 Stirrups @ 7" o/c. Required for first and last 10 feet of each rib.	12.5" Thick Panel 4" Top Hat 2-#8 Bottom Rebar #3 Stirrups @ 8" o/c. Required for first and last 10 feet of each rib.

NOTE

These tables are for estimating purposes only, not for construction. The final design of a concrete structure must be completed by a licensed professional engineer.

3 ESTIMATING QUAD-DECK PROJECTS

From building plans & specifications an estimate can be prepared for Quad-Deck materials and accessories, as well as preliminary quantities & costs of some other materials and labor necessary for the project (provided by others).

3.1 Send Building Plans & Design Information

We are committed to provide accurate and timely information to integrate a Quad-Deck solution into your building. The following will help:

- **Send building plans** via email or download-services in AutoCAD DWG or similar file formats. PDF plans work for rough area estimates or simple layouts. Complete plan sets, including structural drawings, are preferred.
- Clearly **describe the portions of the building** to be built with Quad-Deck, and which areas are omitted.
- **Include the required maximum live-load** or clearly describe the **use category** of the building.
- Include any other important information, like **site location**, applicable building code, and **special conditions**, like high wind exposure or seismic activity.
- Indicate whether budget cost information for the project is needed or an order needs to be placed.

3.2 Area Estimates, Shop Drawings, Detailed Quotes

The Quad-Lock estimating program can assist in determining either rough budgeting information or a detailed quote:

Area Estimates

For early stage design and budgeting purposes, Quad-Lock and its distributors can provide a rough “area estimate” with some suggested design parameters for Quad-Deck panel thickness, slab thickness, and reinforcement based on **2.18 Quad-Deck Span Tables**. These suggestions are for estimating purposes only – not for construction. Anticipated **shipping costs** can be added on request.

Shop Drawings

If a project is getting specified with Quad-Deck, a **Shop Drawing / Layout** can be prepared that clearly depicts the Quad-Deck panels in their intended positions. Structural and architectural plans are usually needed, preferably in AutoCAD (or similar) format. For simple projects PDF format may suffice. Shop drawings will indicate:

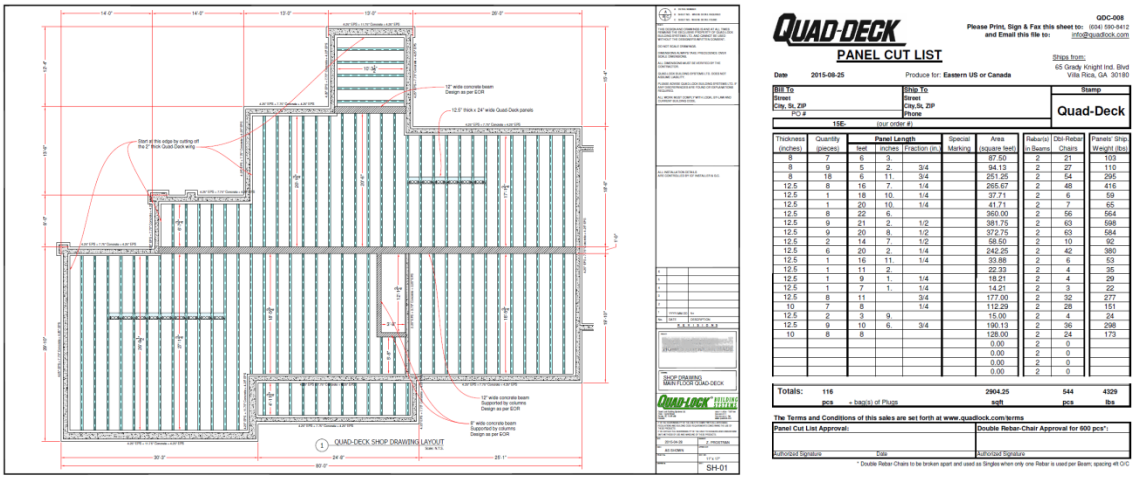
- Panel Lengths (rounded to 1/4" [6mm]) depending on the type of supporting walls or elements and connection details. Wall width specifications should be included in the plan package.
- Panel Thicknesses, if multiple thicknesses are used.

Upon request, Special Markings (numbers or letter codes) can be specified for identification of panel groups.

Detailed Quotes

A detailed quote can be prepared based on final building plans. A quote includes the **final Shop Drawing** and a **Panel Cut List** for signature.

Verify the Shop Drawing reflects what’s required for the project and that it **matches the Panel Cut List**.



QUAD-DECK

PANEL CUT LIST

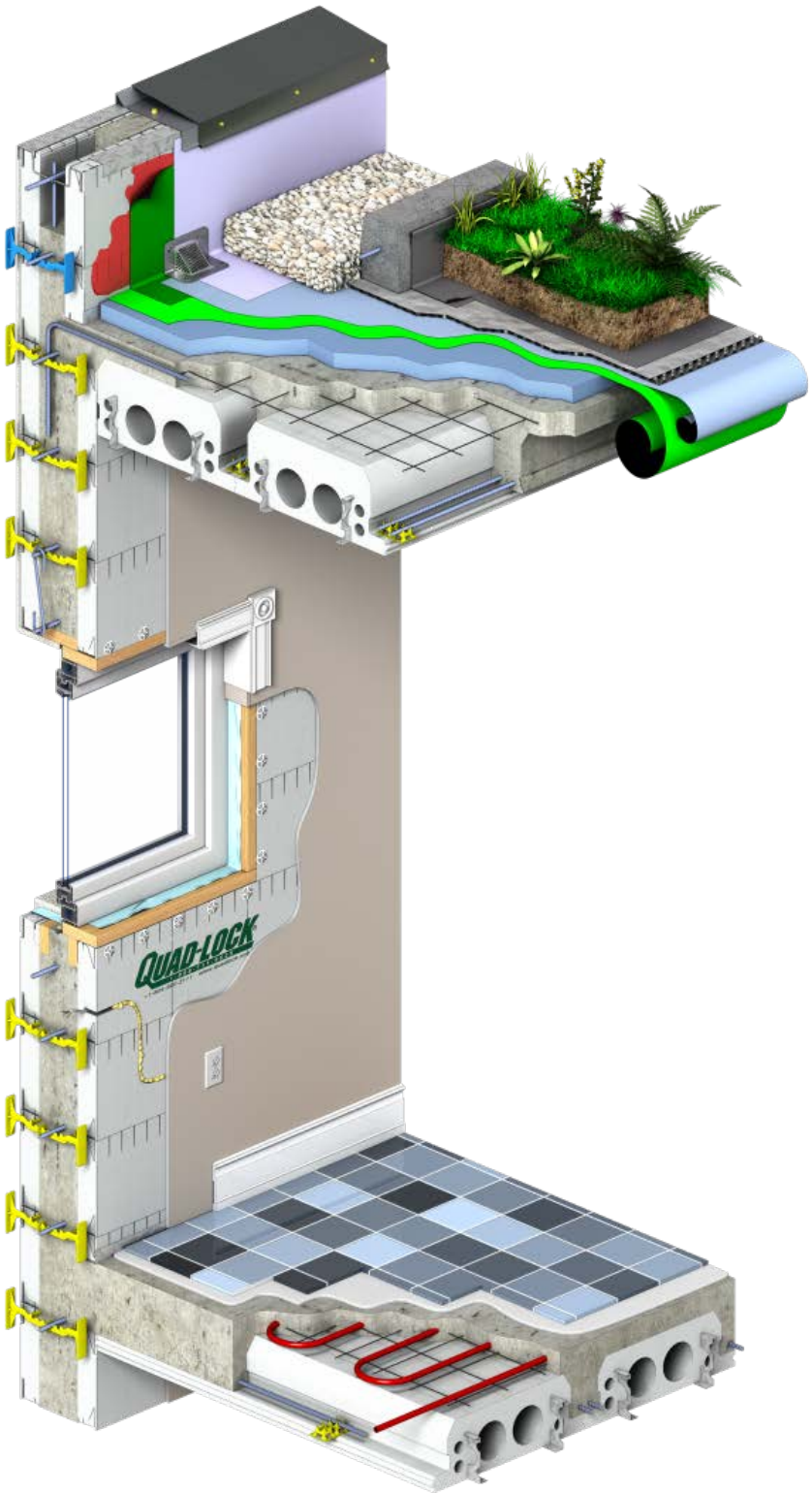
Thickness (inches)	Quantity (pieces)	Panel Length feet	inches	Fraction (in.)	Special Marking	Area (square feet)	Rebar(s) in Beams	Dbl-Rebar Chairs	Panels' Ship Weight (lbs)
6	7	6	2.			87.50	2	21	103
6	9	5	2.	3/4		94.13	2	27	110
6	18	6	11.	3/4		251.25	2	54	295
12.5	8	16	7.	1/4		265.67	2	48	416
12.5	1	18	10.	1/4		37.71	2	6	59
12.5	1	20	10.	1/4		41.71	2	7	65
12.5	8	22	6.			360.00	2	56	564
12.5	9	21	2.	1/2		381.75	2	63	598
12.5	9	20	8.	1/2		372.75	2	63	584
12.5	2	14	7.	1/2		58.50	2	10	92
12.5	6	20	2.	1/4		242.25	2	42	380
12.5	1	16	11.	1/4		33.88	2	6	53
12.5	1	11	2.			22.33	2	4	35
12.5	1	9	1.	1/4		18.21	2	4	29
12.5	1	7	1.	1/4		14.21	2	3	22
12.5	8	11		3/4		177.00	2	32	277
10	7	8		1/4		112.29	2	28	151
12.5	2	3	9.			15.00	2	4	24
12.5	9	10	6.	3/4		190.13	2	36	298
10	8	8				128.00	2	24	173
						0.00	2	0	
						0.00	2	0	
						0.00	2	0	
						0.00	2	0	
Totals:	116					2904.25	544		4329
	pcs					sqft	pcs		lbs

Figure: Example of a Shop Drawing and Panel Cut List

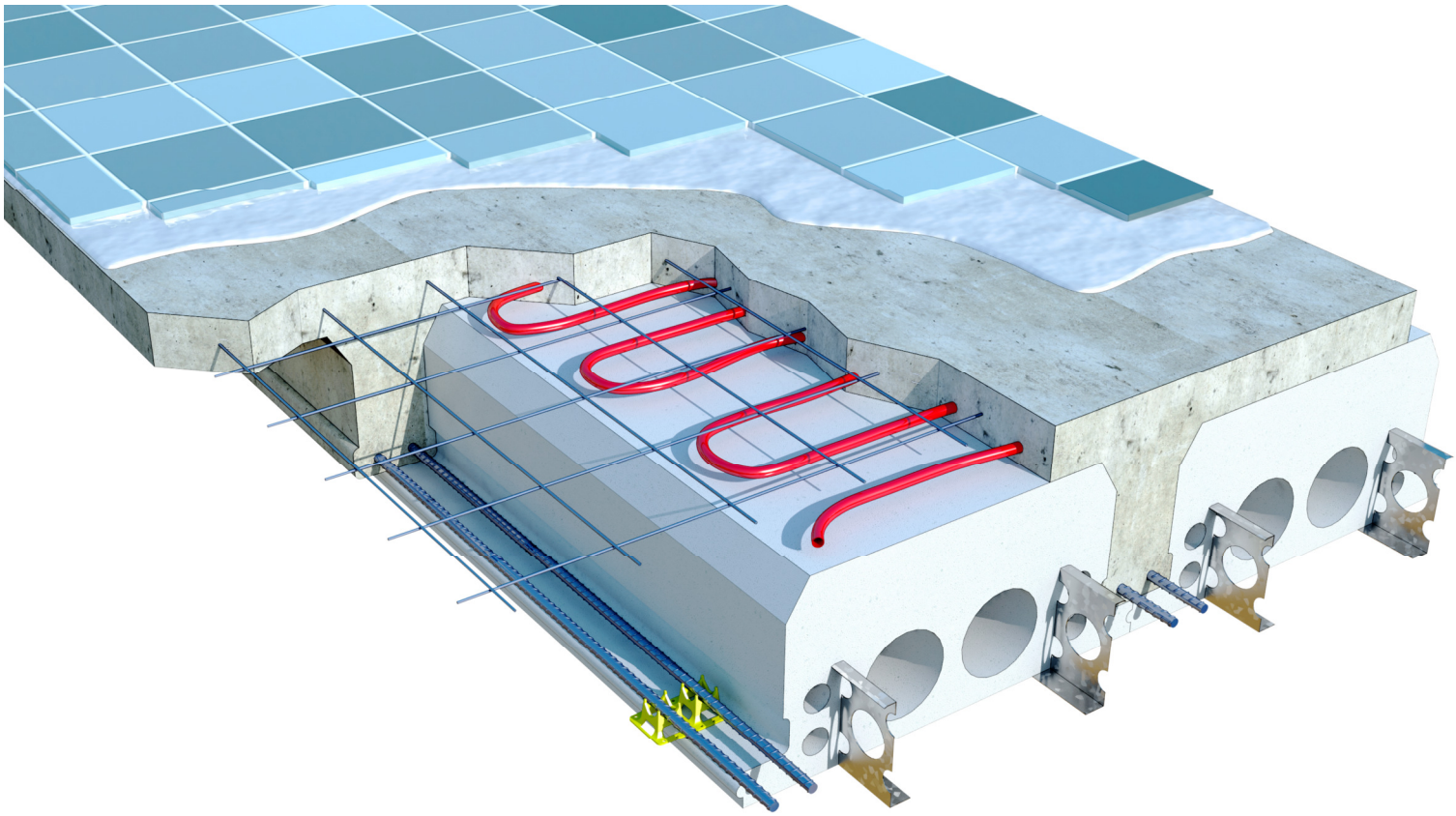
APPENDIX A: QUAD-DECK TYPICAL DETAILS

Download the latest AutoCAD DWG details

The following detail drawings are offered as a general guideline for design professionals to integrate Quad-Deck assemblies into the building designs. All details are for informational purposes only. In the event of a conflict between approved, site-specific, engineered project drawings and the below details or other information in the Manuals, the approved site-specific drawings shall govern.



QUAD-DECK TYPICAL DETAIL DRAWINGS



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QUAD-LOCK® Building Systems Ltd.

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604.590.8412 - fax
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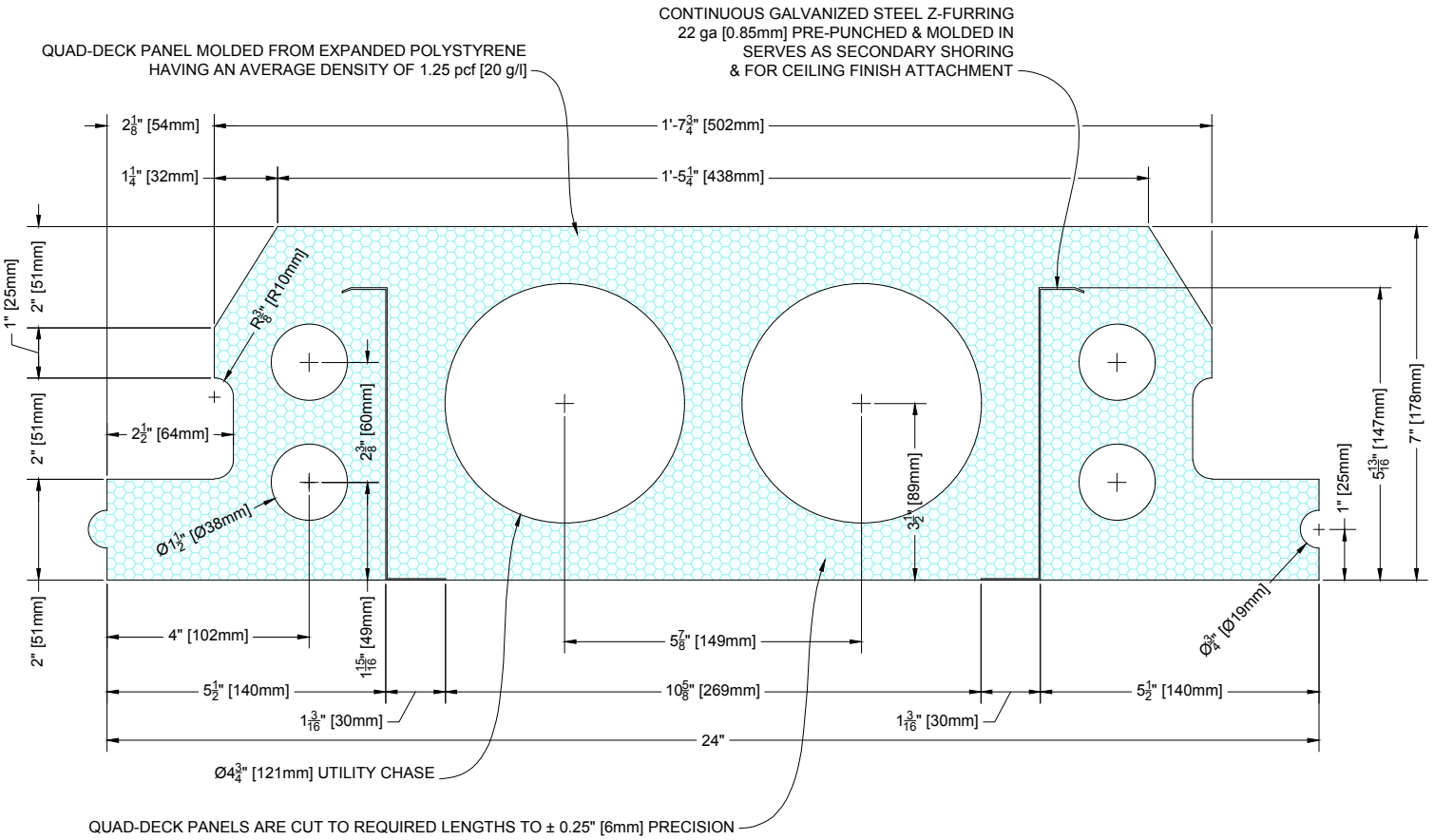
TYPICAL QUAD-DECK DETAILS

DATE DRAWN:	2015-08-25	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN



1 7" [178mm] Quad-Deck Panel

Scale: N.T.S.

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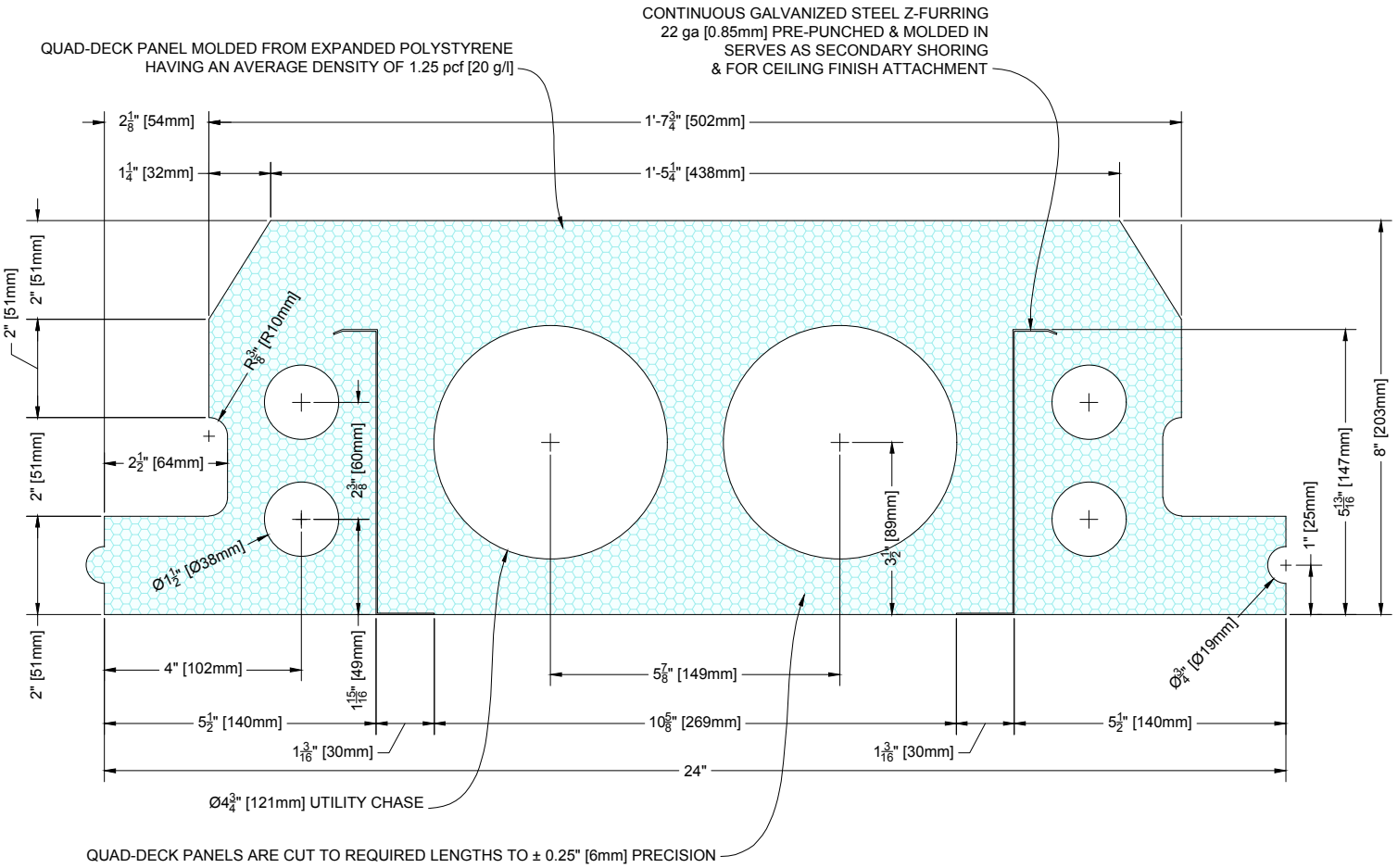
7" [178mm] Quad-Deck Panel

DATE DRAWN: 2015-01-15		COMMENTS: N/A	
REVISION NO: YYYY-MM-DD		SHEET SIZE: 8.5" x 11" [216mm x 279mm]	
REVISION DATE: N/A		SCALE: NOT TO SCALE	DRAWING NO: QD-101
DRAWN BY: Z. PROSTRAN		APPROVED BY: G. KUSTERMANN	



1 8" [203mm] Quad-Deck Panel

Scale: N.T.S.

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8" [203mm] Quad-Deck Panel

DATE DRAWN: 2015-01-15		COMMENTS: N/A	
REVISION NO: YYYY-MM-DD		SHEET SIZE: 8.5" x 11" [216mm x 279mm]	
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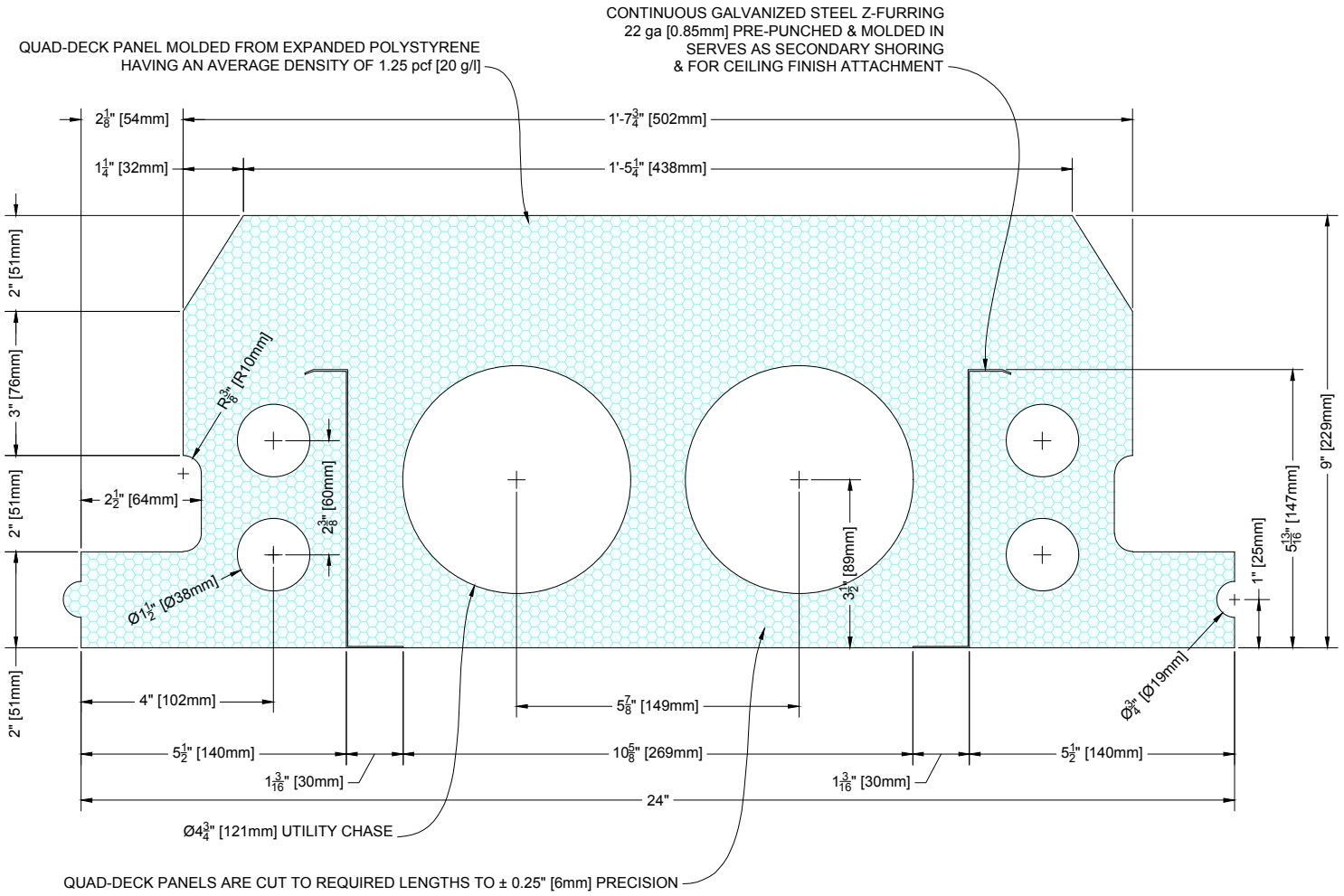

1 9" [229mm] Quad-Deck Panel

Scale: N.T.S.

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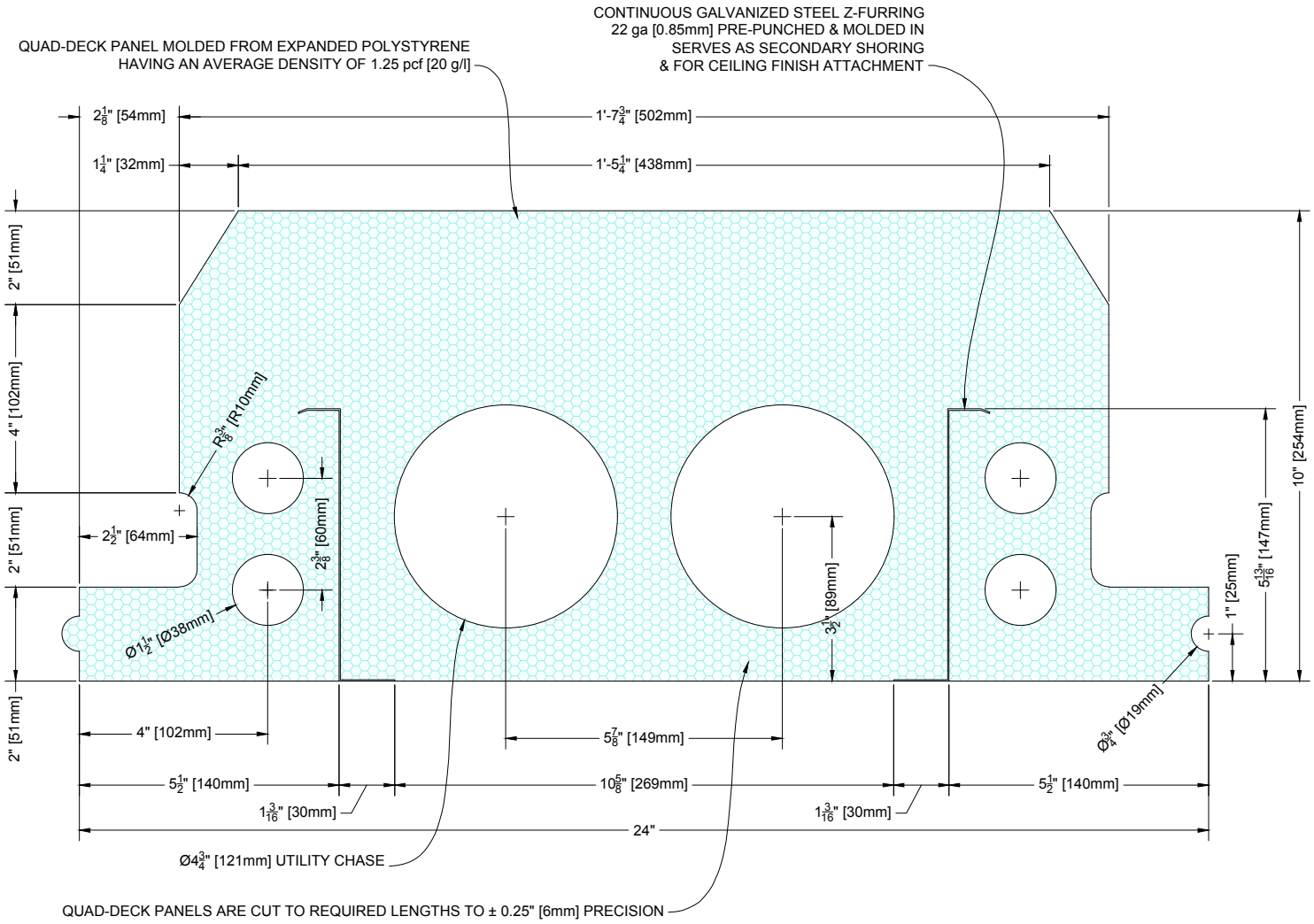
9" [229mm] Quad-Deck Panel

DATE DRAWN: 2015-01-15		COMMENTS: N/A	
REVISION NO: YYYY-MM-DD		SHEET SIZE: 8.5" x 11" [216mm x 279mm]	
REVISION DATE: N/A		SCALE: NOT TO SCALE	DRAWING NO: QD-103
DRAWN BY: Z. PROSTRAN		APPROVED BY: G. KUSTERMANN	



1 10" [254mm] Quad-Deck Panel

Scale: N.T.S.

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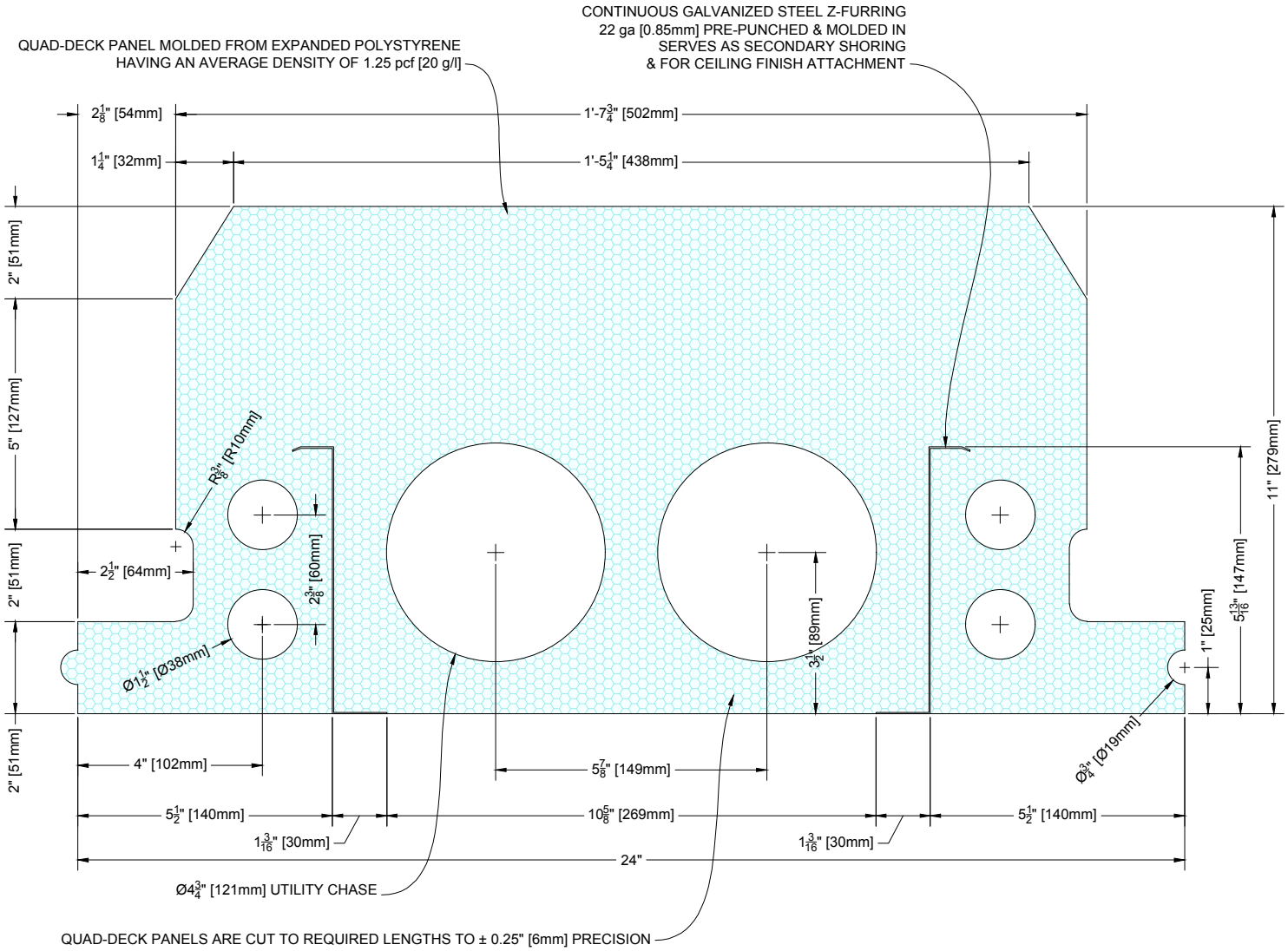
10" [254mm] Quad-Deck Panel

DATE DRAWN: 2015-01-15		COMMENTS: N/A	
REVISION NO: YYYY-MM-DD		SHEET SIZE: 8.5" x 11" [216mm x 279mm]	
REVISION DATE: N/A		SCALE: NOT TO SCALE	DRAWING NO: QD-104
DRAWN BY: Z. PROSTRAN		APPROVED BY: G. KUSTERMANN	



1 11" [279mm] Quad-Deck Panel

Scale: N.T.S.

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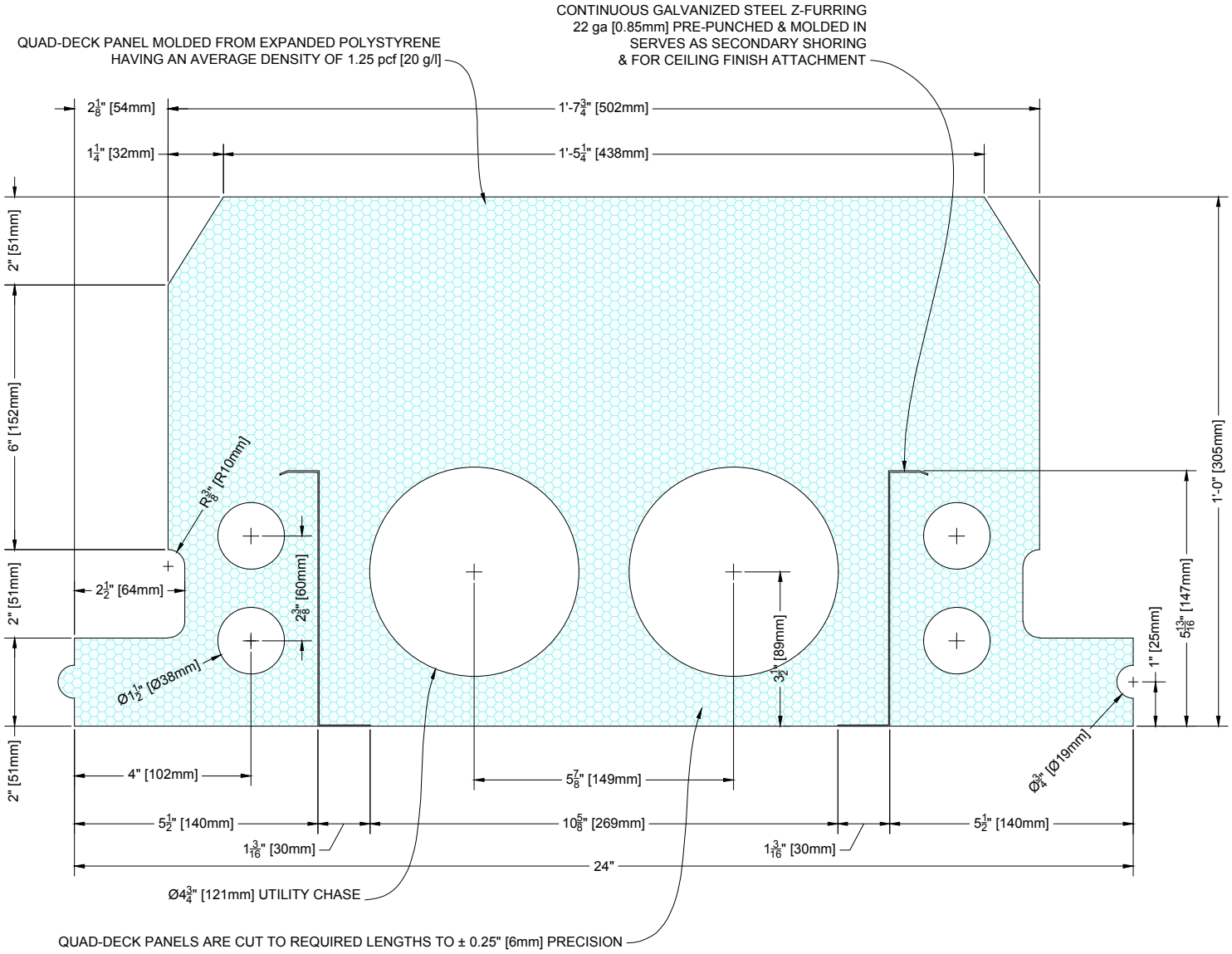
11" [279mm] Quad-Deck Panel

DATE DRAWN: 2015-01-15		COMMENTS: N/A	
REVISION NO: YYYY-MM-DD		SHEET SIZE: 8.5" x 11" [216mm x 279mm]	
REVISION DATE: N/A		SCALE: NOT TO SCALE	DRAWING NO: QD-105
DRAWN BY: Z. PROSTRAN		APPROVED BY: G. KUSTERMANN	



1 12" [305mm] Quad-Deck Panel

Scale: N.T.S.

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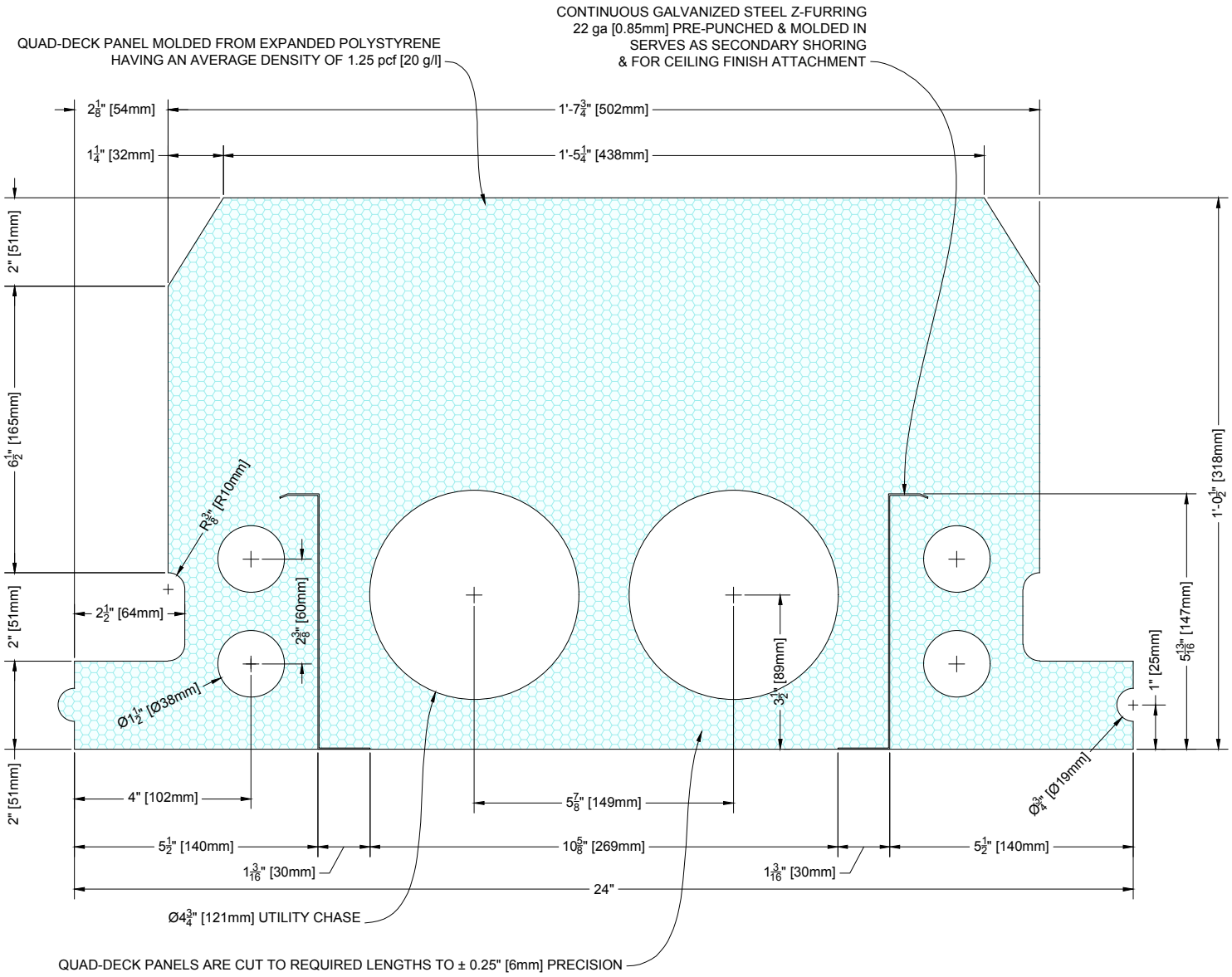
12" [305mm] Quad-Deck Panel

DATE DRAWN: 2015-01-15		COMMENTS: N/A	
REVISION NO: YYYY-MM-DD		SHEET SIZE: 8.5" x 11" [216mm x 279mm]	
REVISION DATE: N/A		SCALE: NOT TO SCALE	DRAWING NO: QD-106
DRAWN BY: Z. PROSTRAN		APPROVED BY: G. KUSTERMANN	



1 12.5" [318mm] Quad-Deck Panel

Scale: N.T.S.

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12.5" [318mm] Quad-Deck Panel

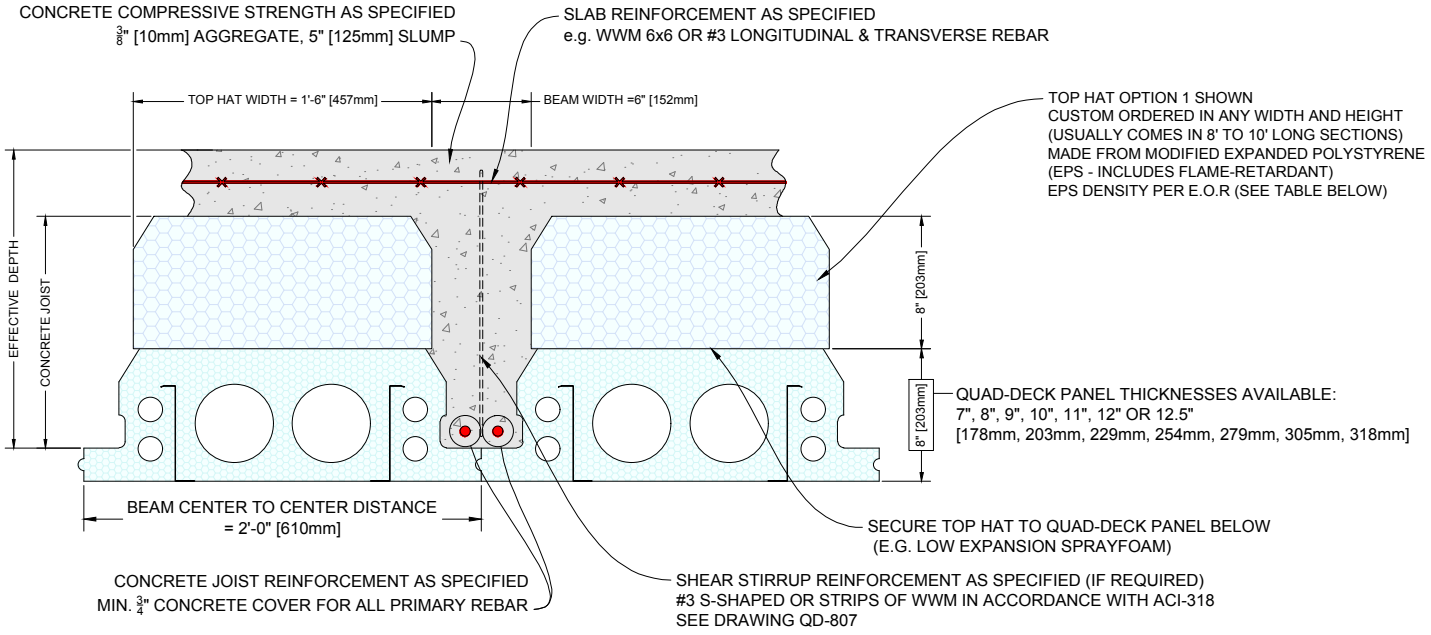
DATE DRAWN: 2015-01-15		COMMENTS: N/A	
REVISION NO: YYYY-MM-DD		SHEET SIZE: 8.5" x 11" [216mm x 279mm]	
REVISION DATE: N/A		SCALE: NOT TO SCALE	DRAWING NO: QD-107
DRAWN BY: Z. PROSTRAN		APPROVED BY: G. KUSTERMANN	

NOTES:

TOP HATS INCREASE QUAD-DECK'S EFFECTIVE BEAM DEPTH WHICH IN TURN INCREASES LIVE LOAD CAPACITY AND CLEAR SPAN OF THE FLOOR SYSTEM

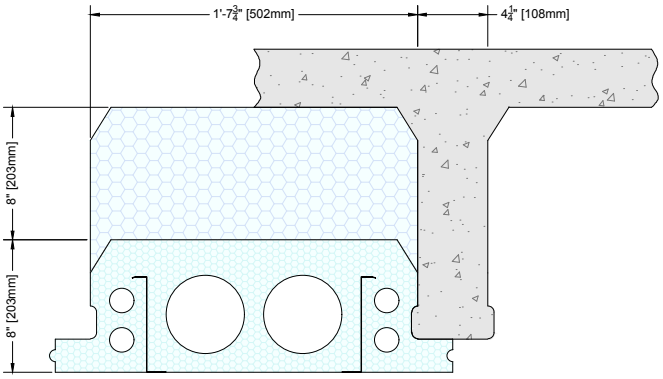
WHEN SELECTING TOP HATS, PAY ATTENTION TO MAXIMUM SLENDERNESS (HEIGHT TO WIDTH) RATIO FOR CONCRETE JOISTS

SEE TABLE AT BOTTOM TO SELECT THE RIGHT TOP HAT EPS DENSITY.



1 CUSTOM TOP HAT - PREFERRED OPTION 1

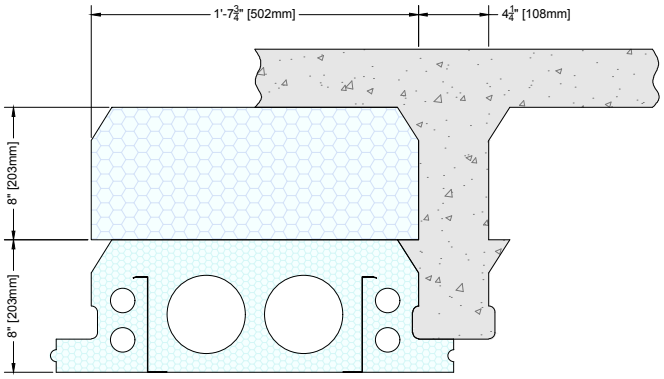
Scale: N.T.S.



2 CUSTOM TOP HAT 2

Scale: N.T.S.

HIGHEST COST OPTION



3 CUSTOM TOP HAT 3

Scale: N.T.S.

Density (PCF: pounds per cubic-foot)	**U.S.** EPS Board Type (ASTM C578)	**Canada** EPS Board Type (CAN/ULC-S701)	**R-VALUE** per inch thickn.	**Comments**
0.75 PCF [12 kg/m3]	Type XI	Does Not Qualify	3.1	For small savings in material cost, but lower insulation value & some compression likely ("footprints")
1.15 PCF [18.5 kg/m3]	Type VIII	Type 1	3.8	Low compression
Quad-Deck 1.25 PCF [20 kg/m3]	Type VIII	Type 1	3.8	Quad-Deck average density

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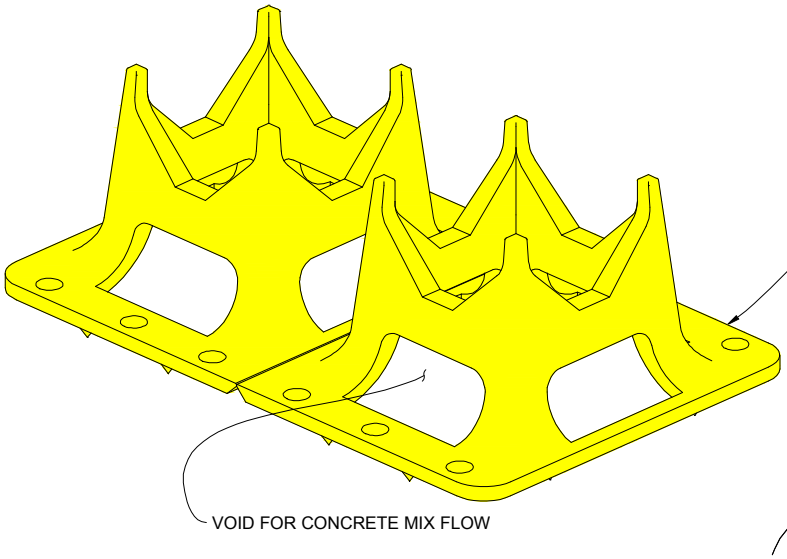
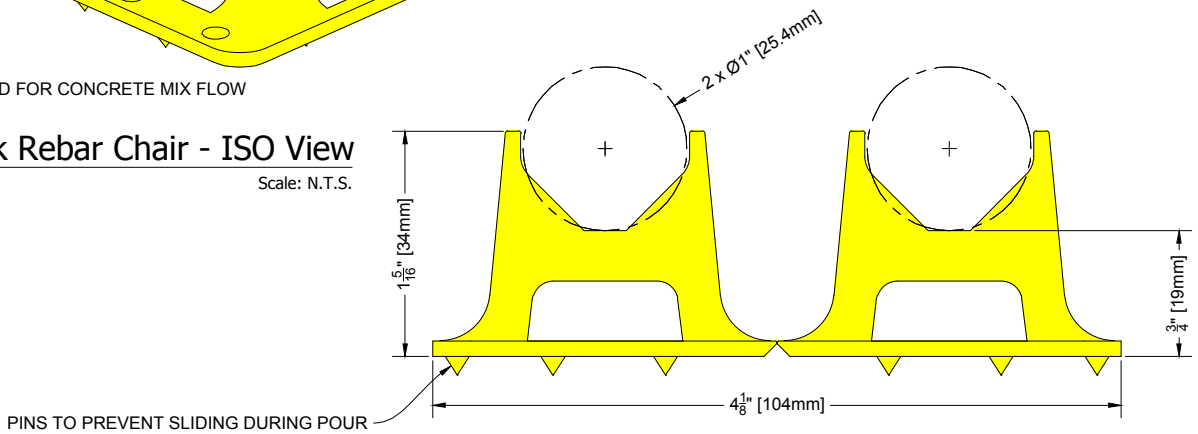
QUAD-DECK TOP HAT DETAIL

DATE DRAWN: 2015-01-15		COMMENTS: N/A	
REVISION NO: YYYY-MM-DD		SHEET SIZE: 8.5" x 11" [216mm x 279mm]	
REVISION DATE: N/A		SCALE: NOT TO SCALE	DRAWING NO: QD-108
DRAWN BY: Z. PROSTRAN		APPROVED BY: G. KUSTERMANN	



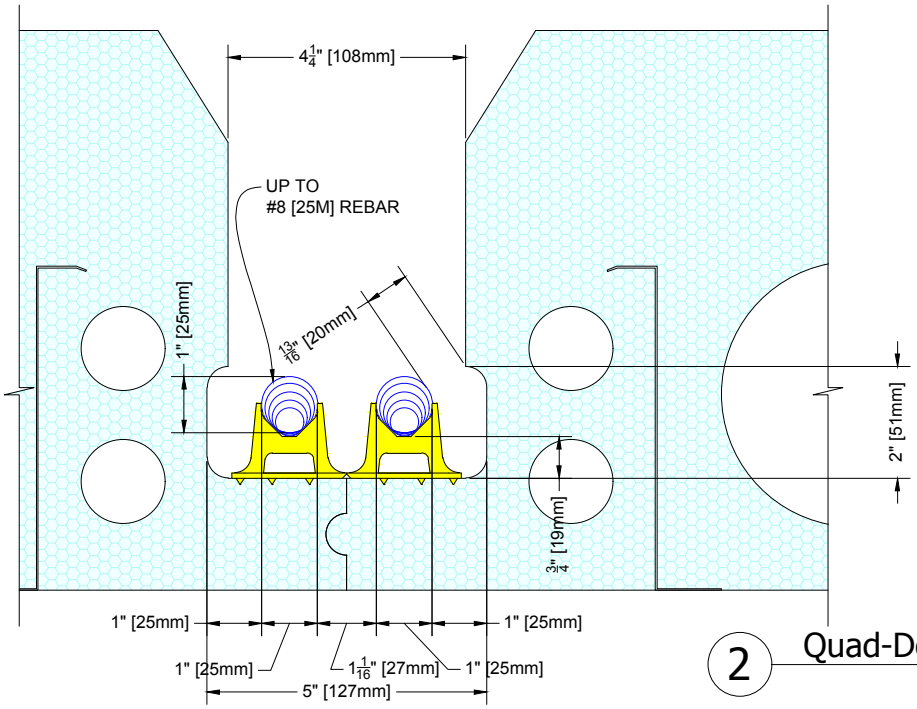
1 Quad-Deck Rebar Chair - ISO View

Scale: N.T.S.



2 Quad-Deck Rebar Chair

Scale: N.T.S.



2 Quad-Deck Rebar Chair - Clearances

Scale: N.T.S.

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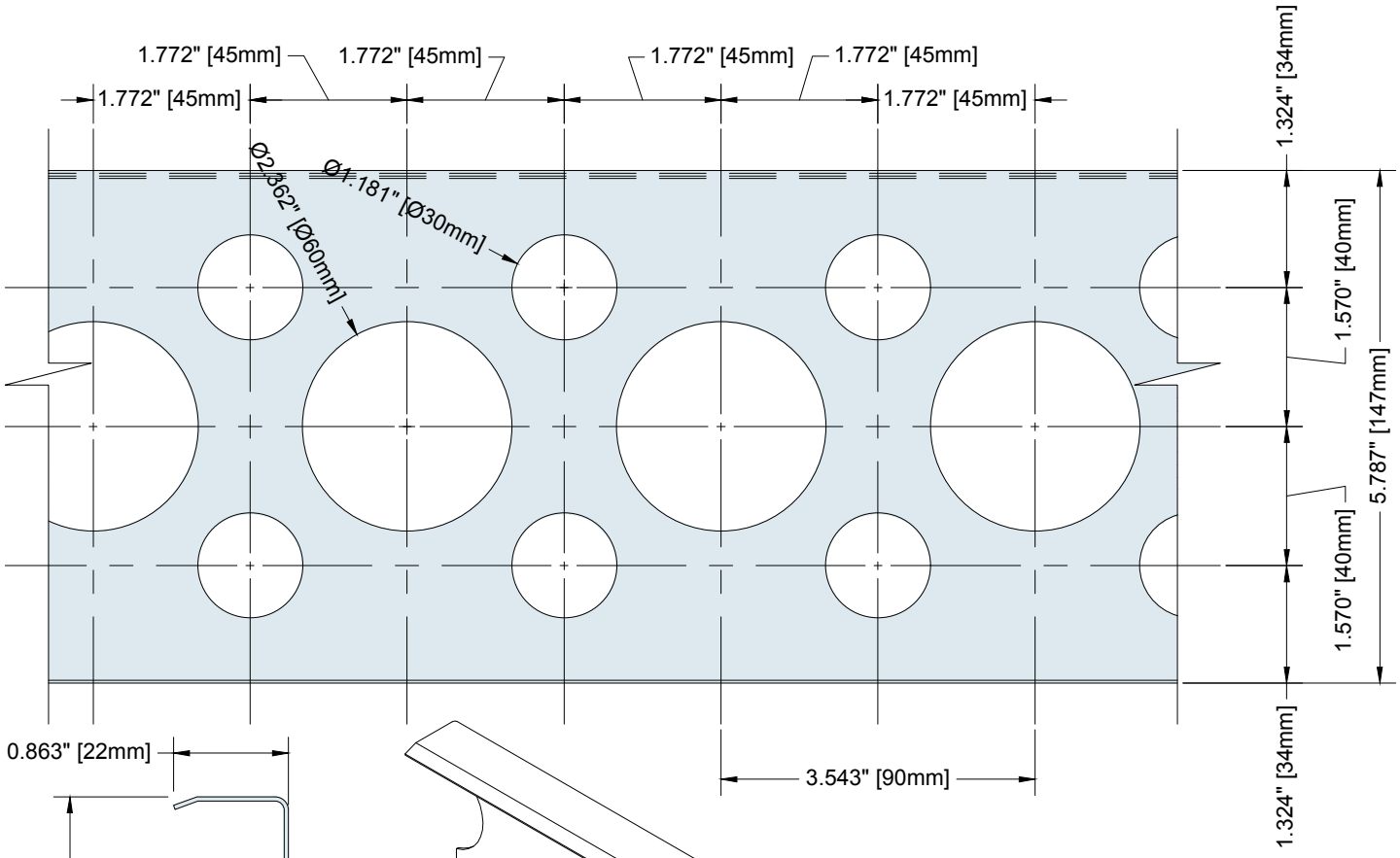
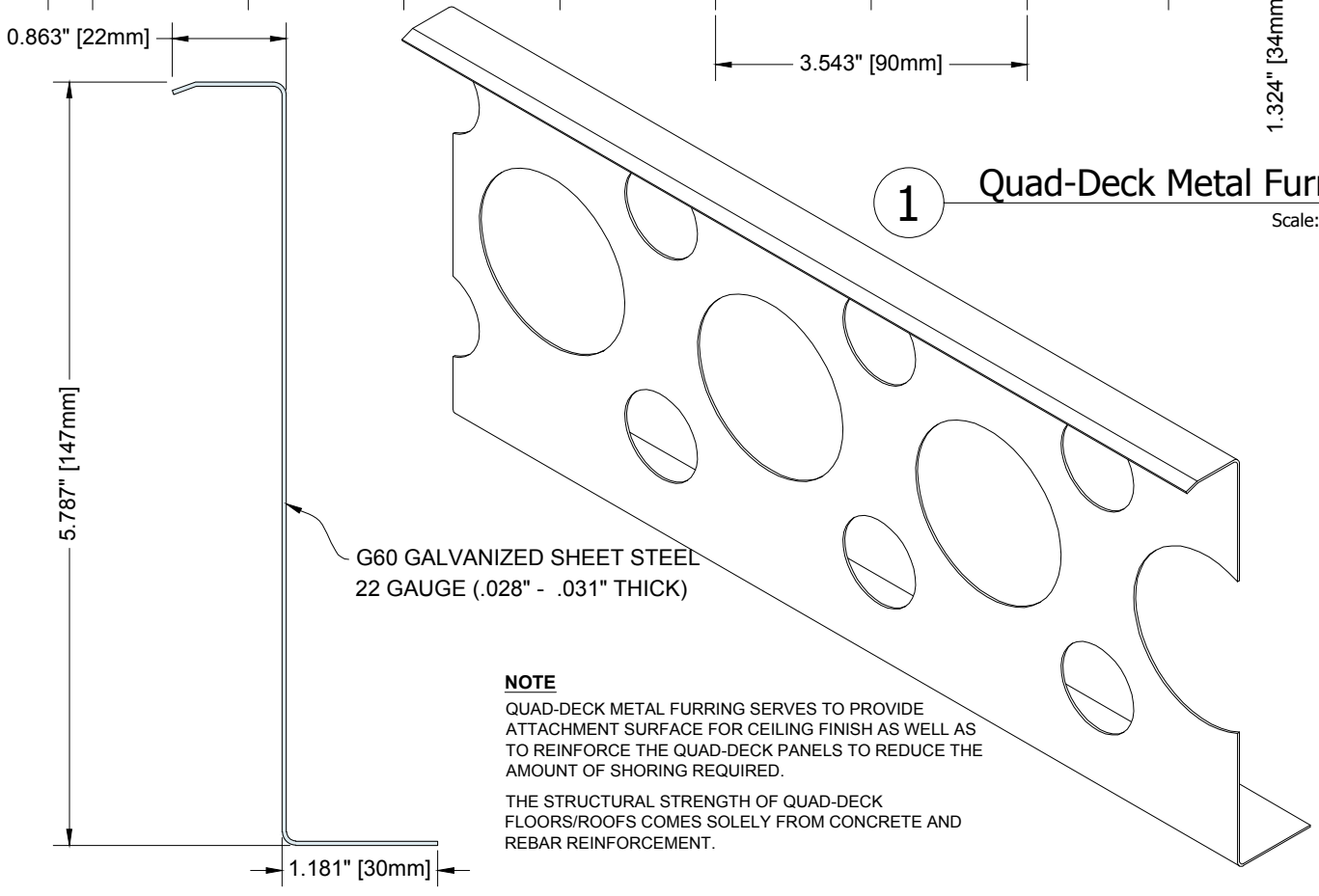
Quad-Deck Rebar Chair & Clearances

DATE DRAWN: 2015-01-15		COMMENTS: N/A	
REVISION NO: YYYY-MM-DD		SHEET SIZE: 8.5" x 11" [216mm x 279mm]	
REVISION DATE: N/A		SCALE: NOT TO SCALE	DRAWING NO: QD-109
DRAWN BY: Z. PROSTRAN		APPROVED BY: G. KUSTERMANN	





1 Quad-Deck Metal Furring

Scale: N.T.S.

NOTE

QUAD-DECK METAL FURRING SERVES TO PROVIDE ATTACHMENT SURFACE FOR CEILING FINISH AS WELL AS TO REINFORCE THE QUAD-DECK PANELS TO REDUCE THE AMOUNT OF SHORING REQUIRED.

THE STRUCTURAL STRENGTH OF QUAD-DECK FLOORS/ROOFS COMES SOLELY FROM CONCRETE AND REBAR REINFORCEMENT.

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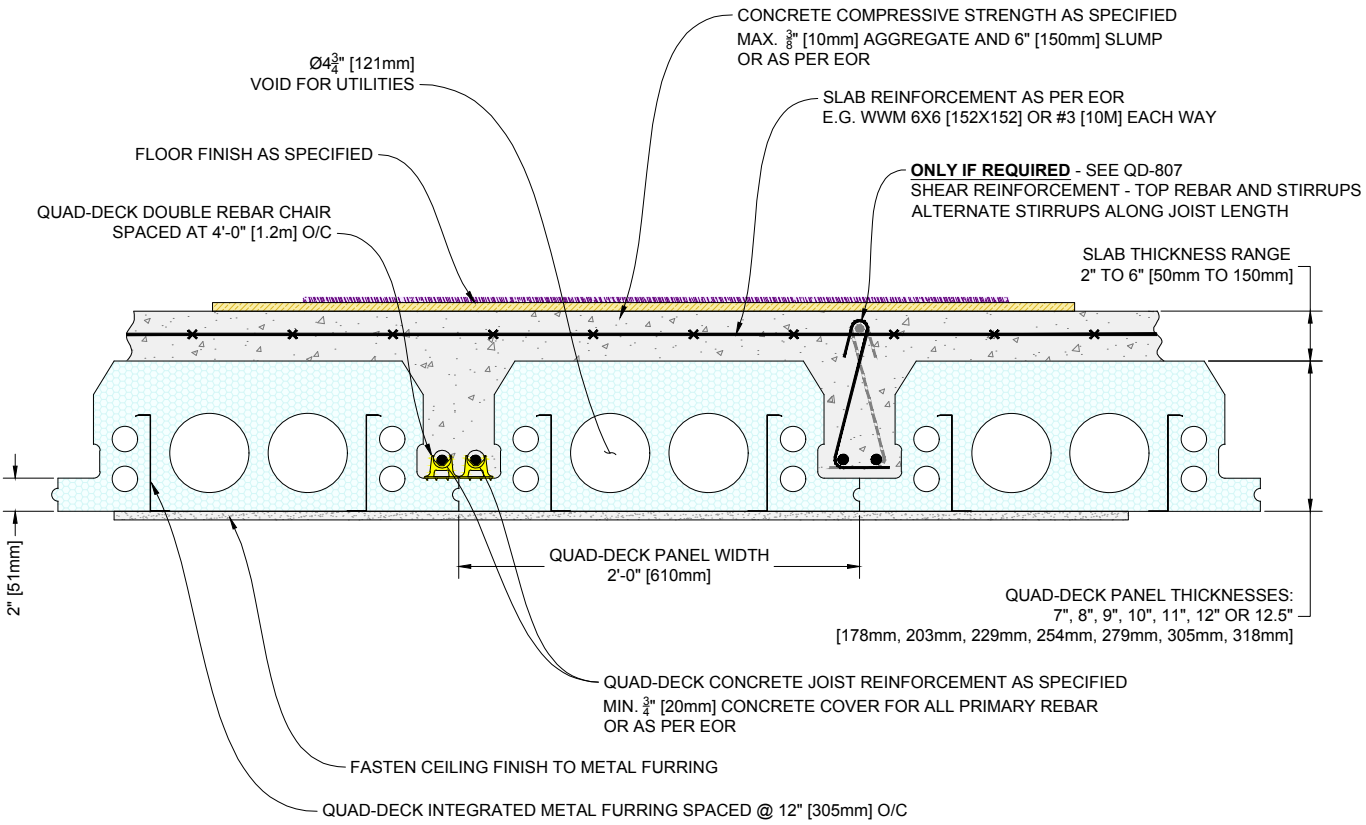
Integrated Quad-Deck Metal Furring

DATE DRAWN:	2015-01-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-110



1 TYPICAL QUAD-DECK FLOOR DETAIL

Scale: N.T.S.

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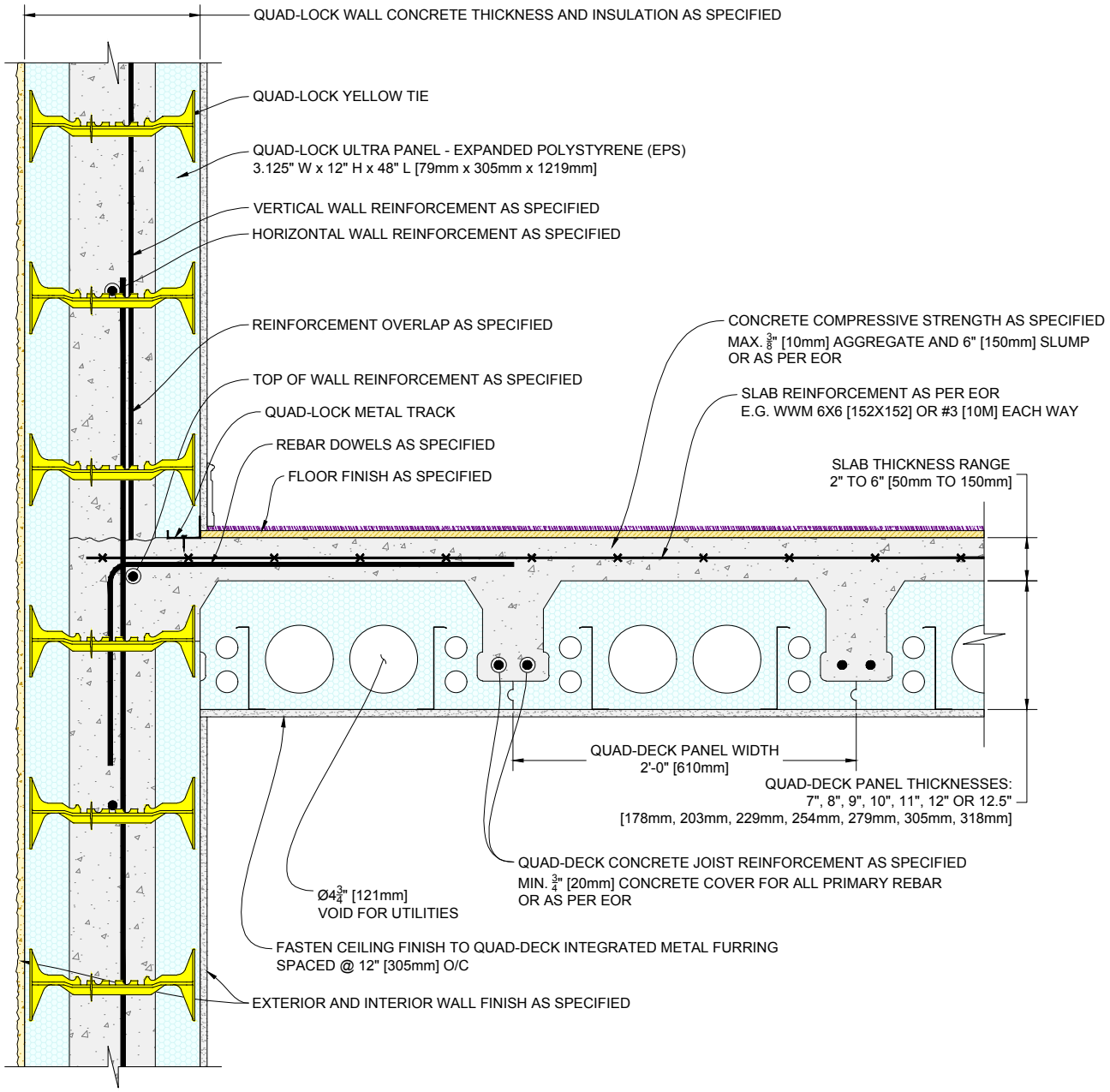
TYPICAL QUAD-DECK FLOOR DETAIL

DATE DRAWN: 2015-03-15		COMMENTS: N/A	
REVISION NO: YYYY-MM-DD		SHEET SIZE: 8.5" x 11" [216mm x 279mm]	
REVISION DATE: N/A		SCALE: NOT TO SCALE	DRAWING NO: QD-201
DRAWN BY: Z. PROSTRAN		APPROVED BY: G. KUSTERMANN	



1 QUAD-DECK PANELS PARALLEL TO QUAD-LOCK WALL

Scale: N.T.S.

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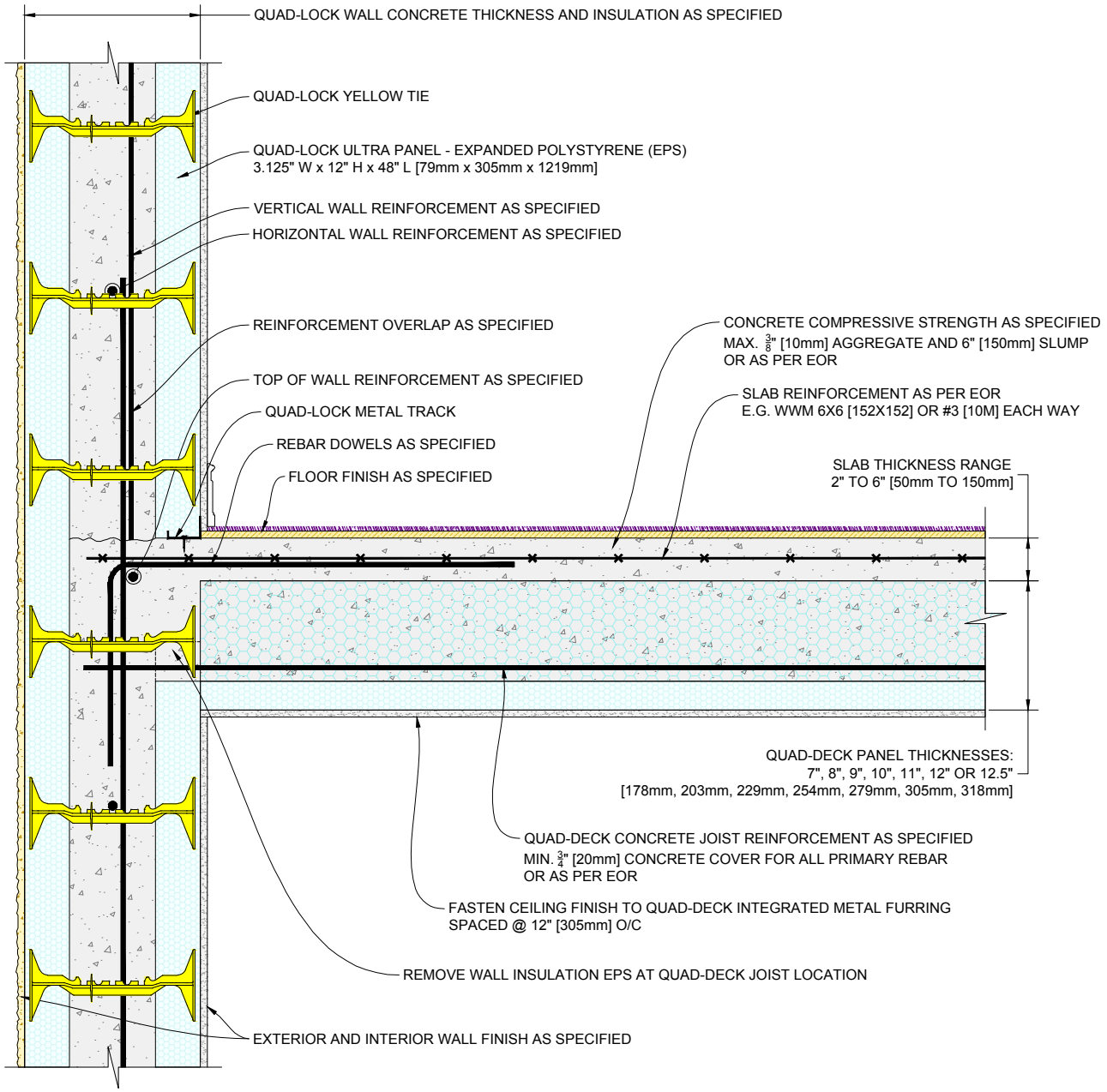
QUAD-DECK TO QUAD-LOCK WALL

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-202



1 QUAD-DECK PANELS PERPENDICULAR TO QUAD-LOCK WALL

Scale: N.T.S.

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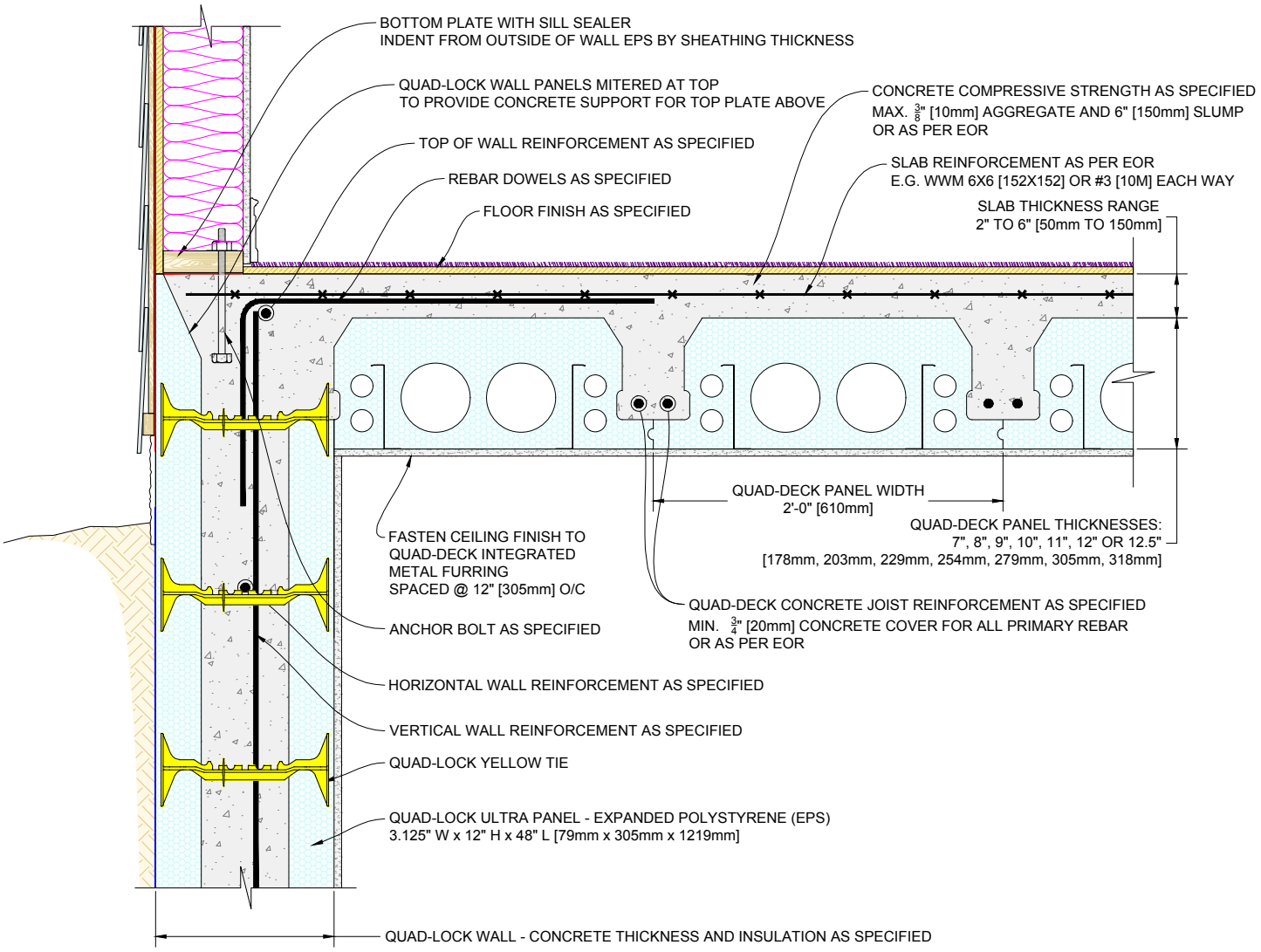
QUAD-DECK TO QUAD-LOCK WALL

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-203



1 QUAD-DECK PANELS PARALLEL TO TOP OF QUAD-LOCK WALL

Scale: N.T.S.

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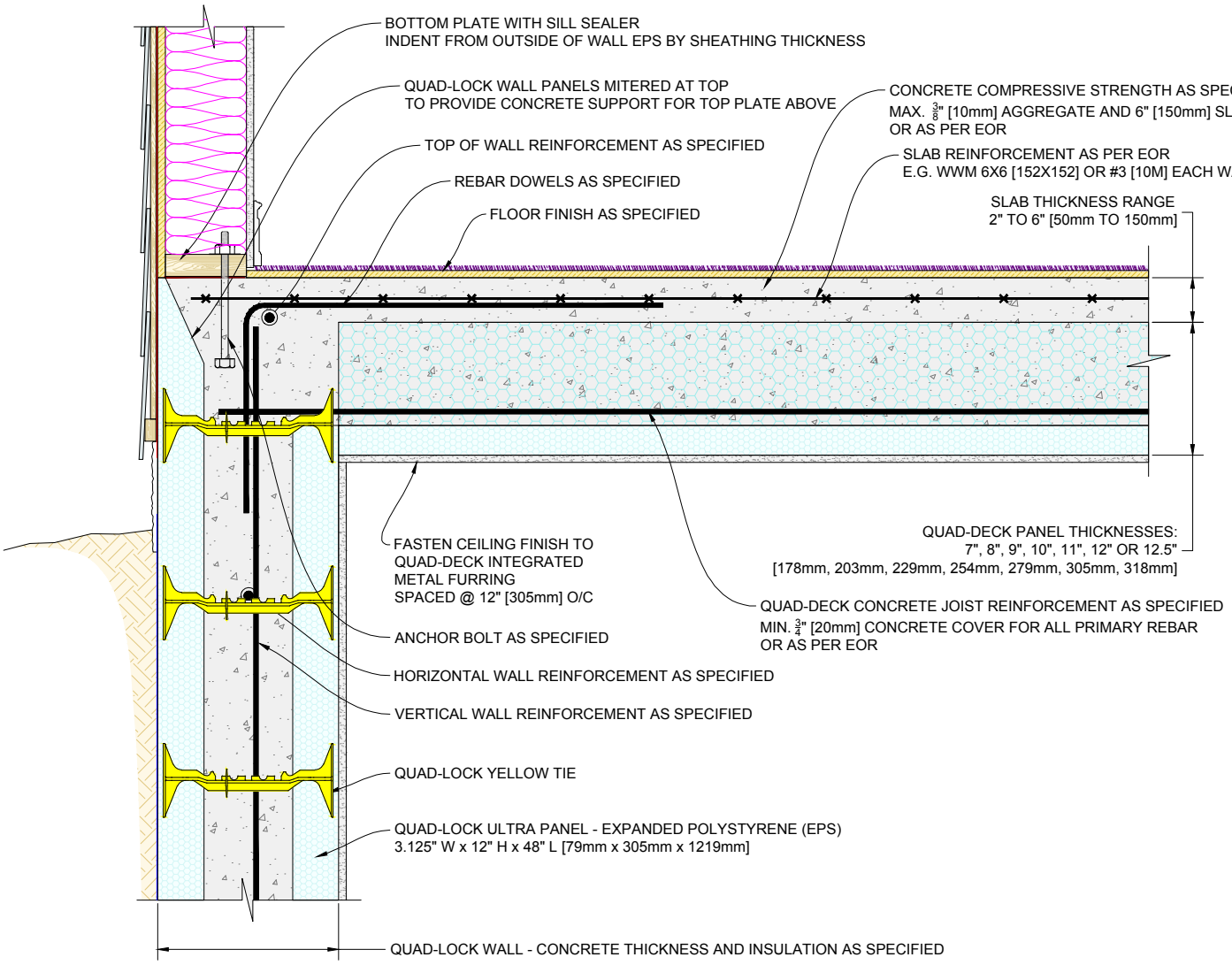
QUAD-DECK TO QUAD-LOCK WALL

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-204



2 QUAD-DECK PANELS PERPENDICULAR TO TOP OF QUAD-LOCK WALL

Scale: N.T.S.

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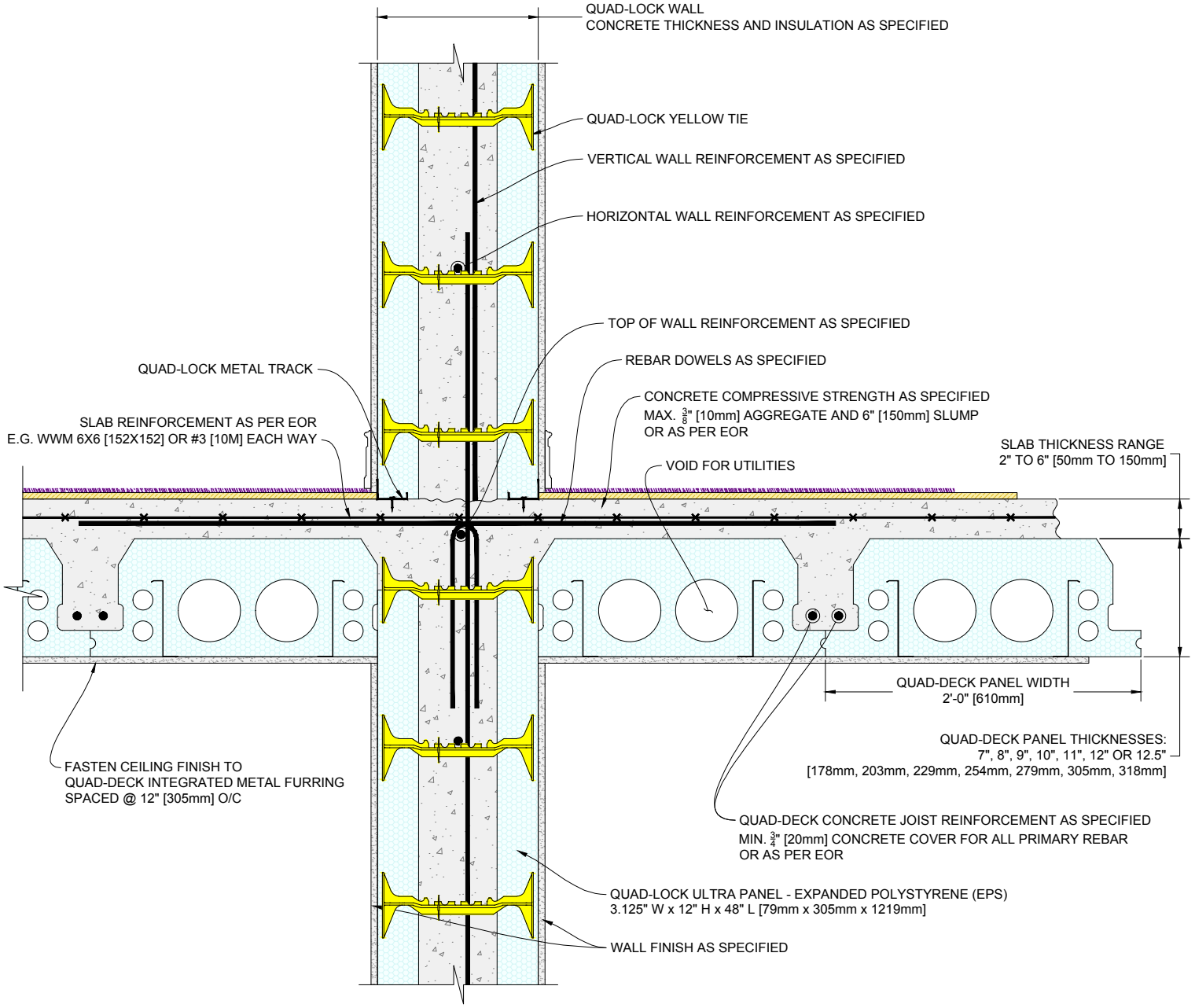
QUAD-DECK TO QUAD-LOCK WALL

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-205



1 QUAD-DECK PANELS PARALLEL TO QUAD-LOCK INTERMEDIATE WALL

Scale: N.T.S.

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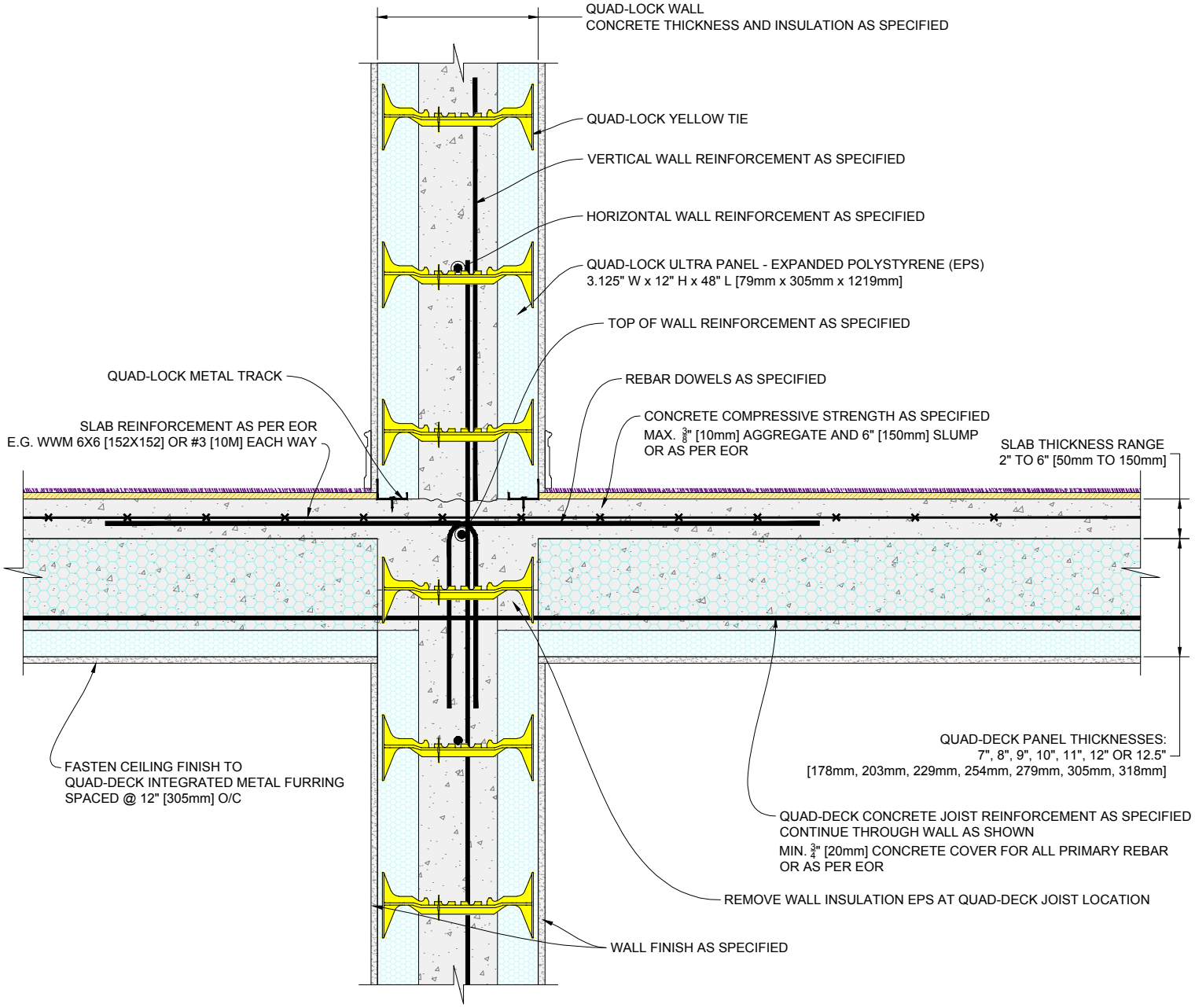
QUAD-DECK TO INTERMEDIATE QUAD-LOCK WALL

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-206



1 QUAD-DECK PANELS PERPENDICULAR TO QUAD-LOCK INTERMEDIATE WALL

Scale: N.T.S.

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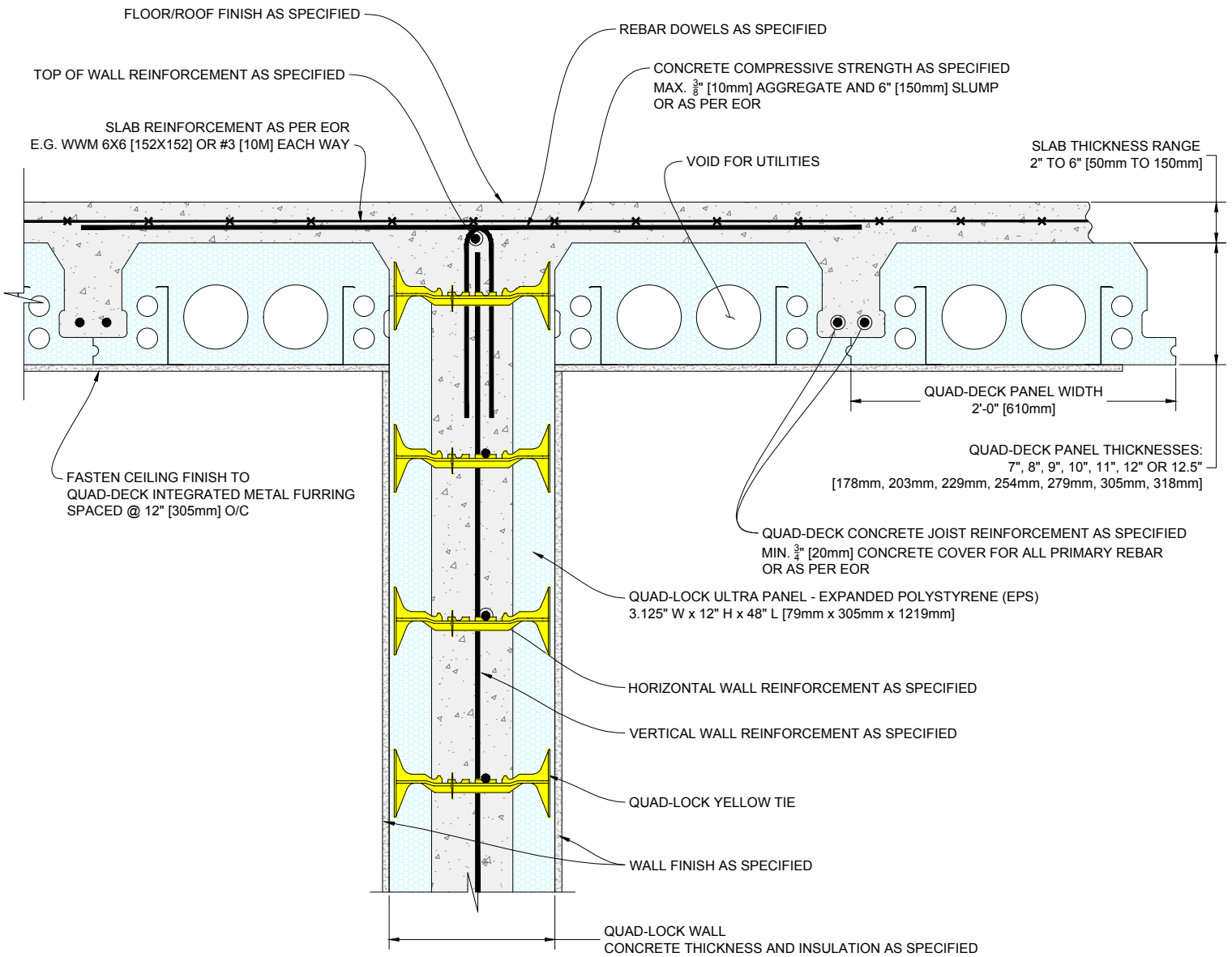
QUAD-DECK TO INTERMEDIATE QUAD-LOCK WALL

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-207



1 QUAD-DECK PANELS PARALLEL TO TOP OF QUAD-LOCK INTERMEDIATE WALL

Scale: N.T.S.

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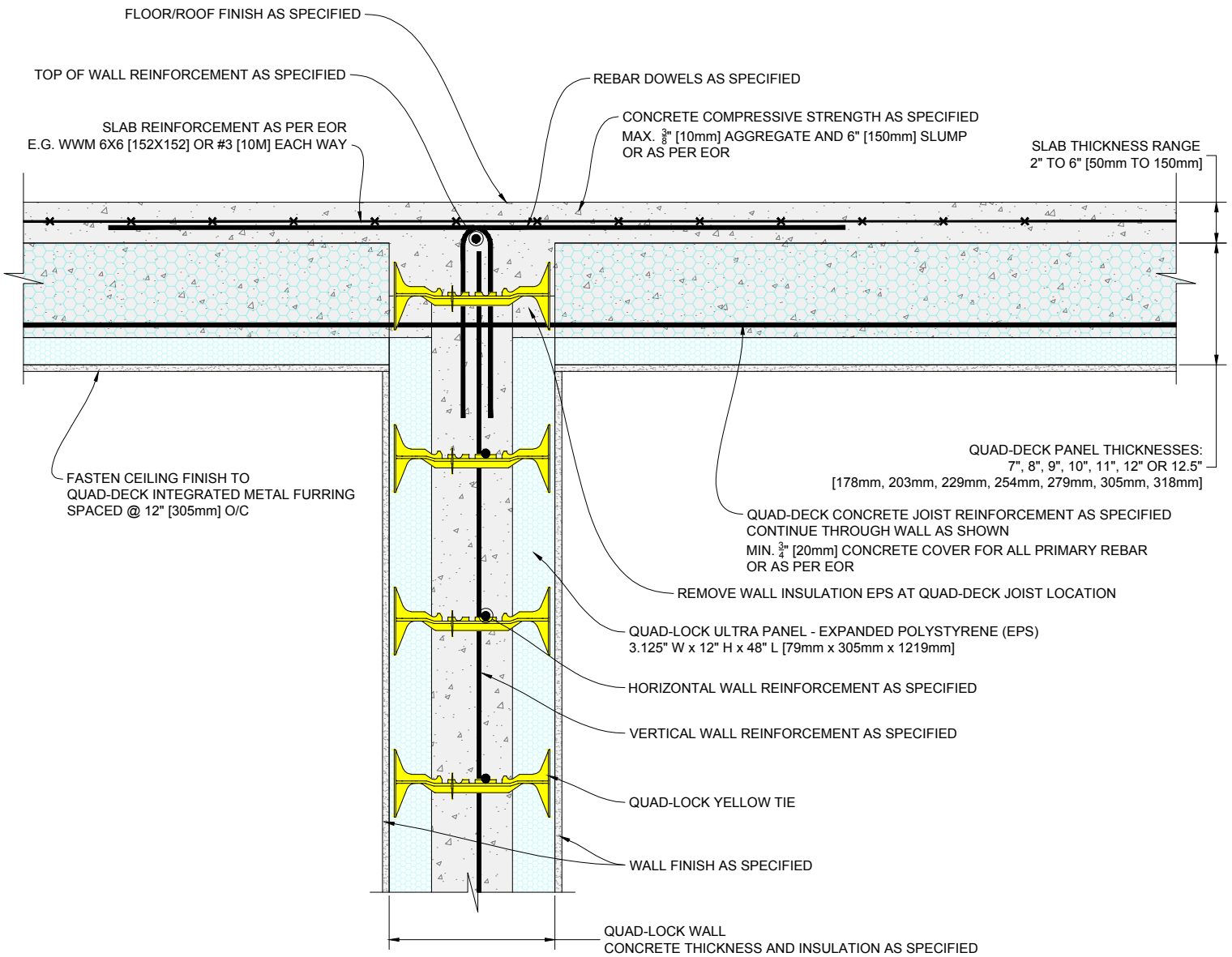
QUAD-DECK TO INTERMEDIATE QUAD-LOCK WALL

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-208



1 QUAD-DECK PANELS PERPENDICULAR TO TOP OF QUAD-LOCK INTERMEDIATE WALL

Scale: N.T.S.

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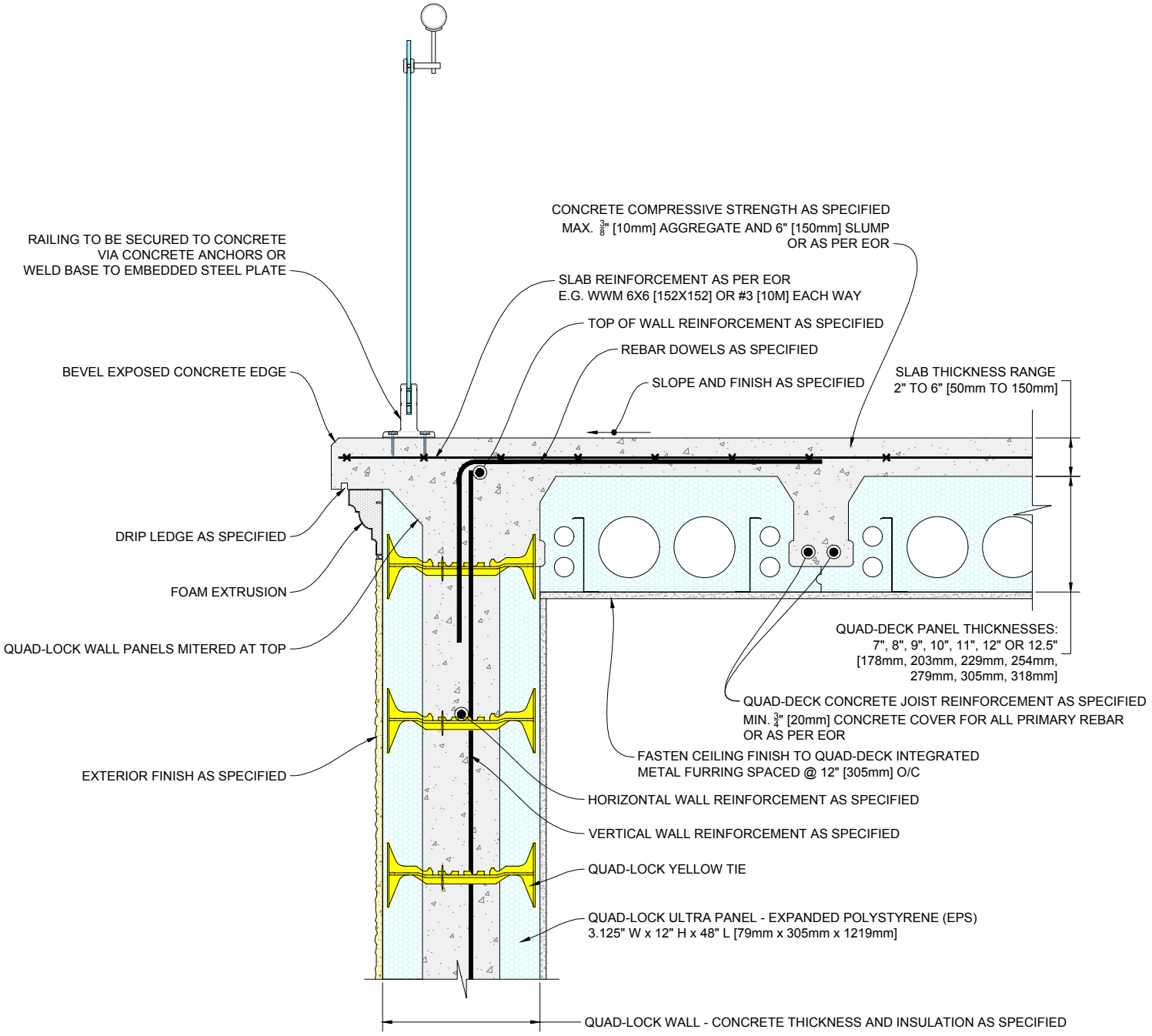
QUAD-DECK TO INTERMEDIATE QUAD-LOCK WALL

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-209



1 QUAD-DECK PANELS PARALLEL TO TOP OF QUAD-LOCK WALL
PORCH CONDITION
Scale: N.T.S.

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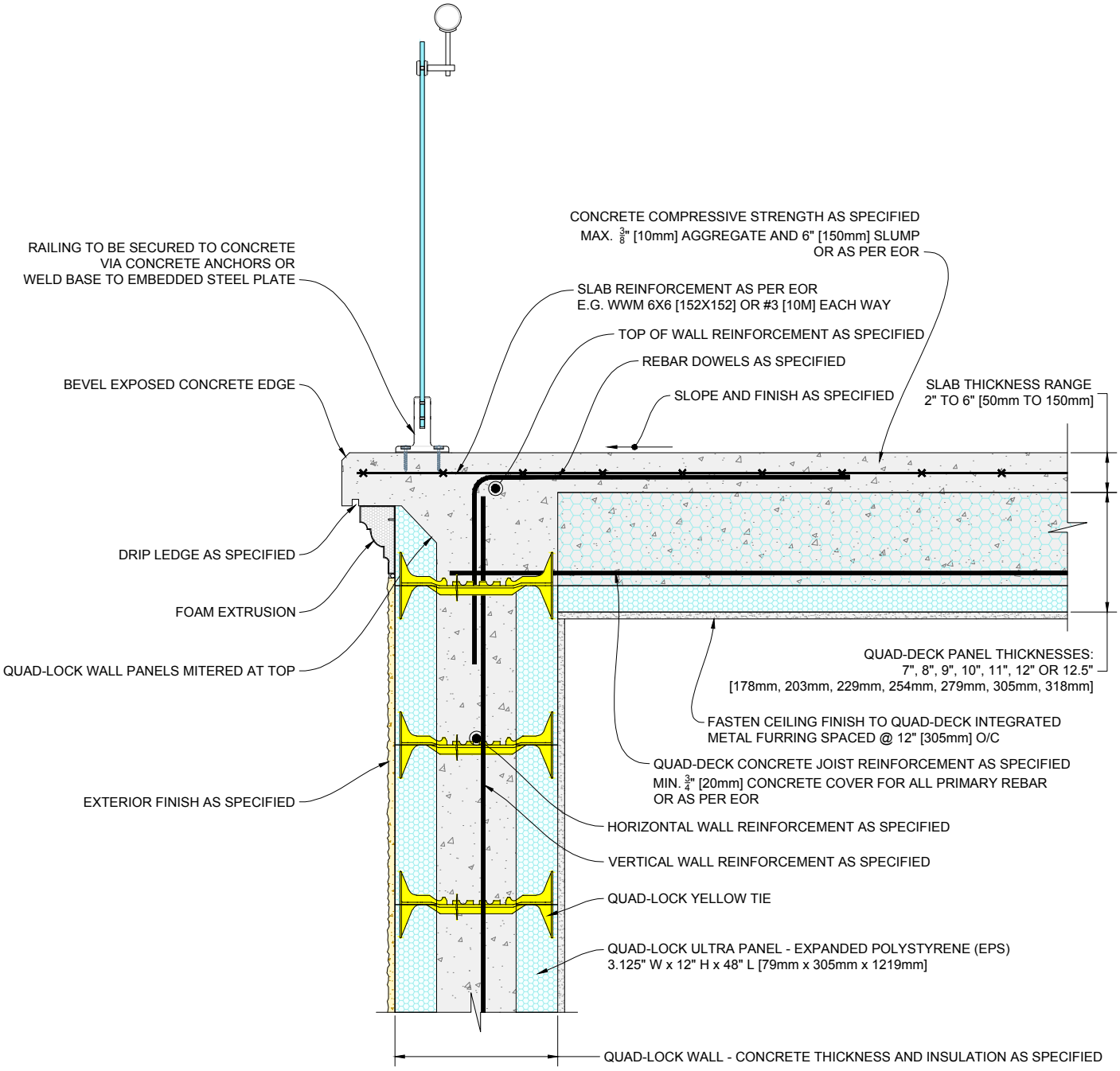
QUAD-DECK TO QUAD-LOCK WALL - EXTERIOR DECK

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-210



2 QUAD-DECK PANELS PERPENDICULAR TO TOP OF QUAD-LOCK WALL
PORCH CONDITION
Scale: N.T.S.

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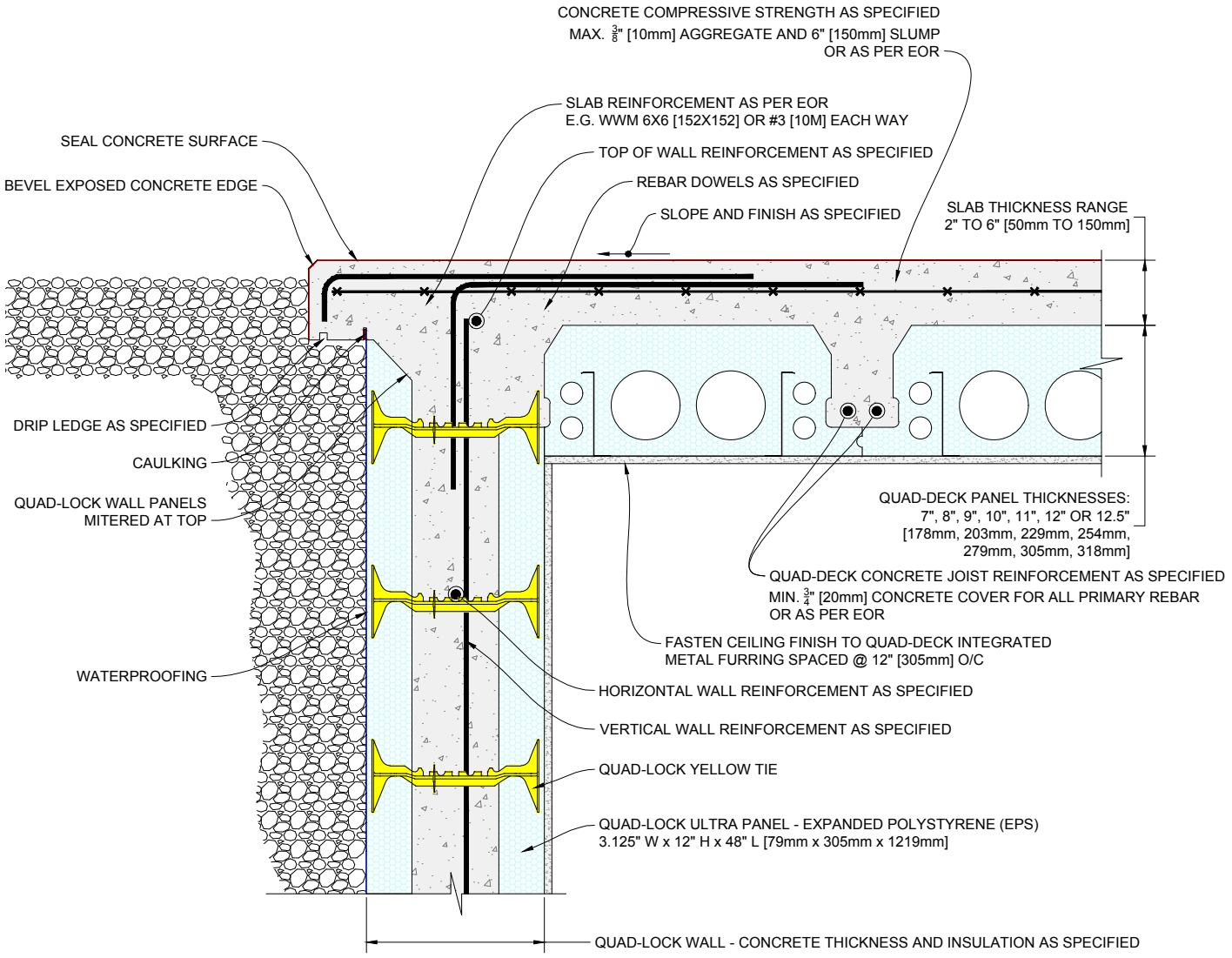
QUAD-DECK TO QUAD-LOCK WALL - EXTERIOR DECK

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-211



1 QUAD-DECK PANELS PARALLEL TO QUAD-LOCK WALL
DRIVEWAY CONDITION Scale: N.T.S.

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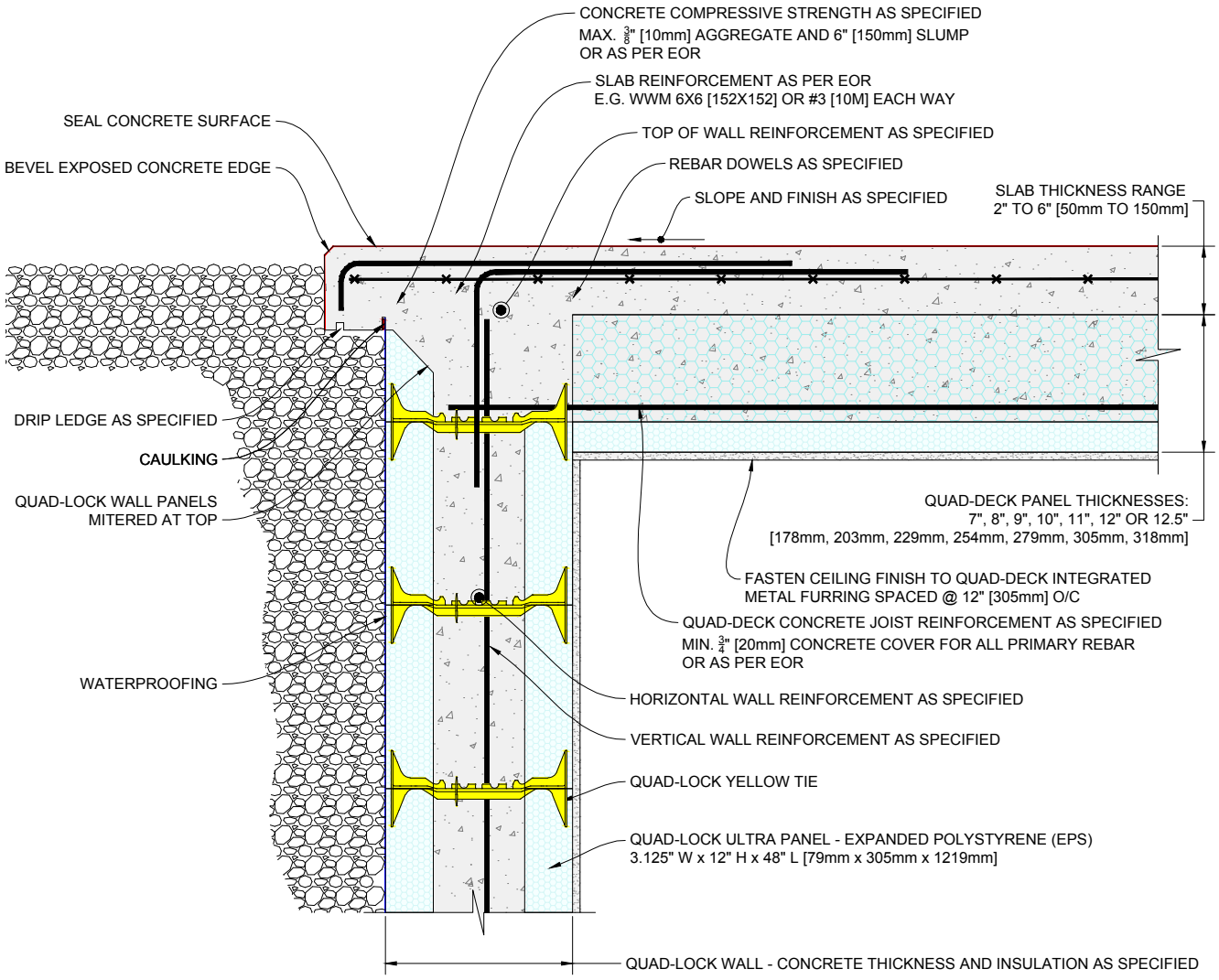
QUAD-DECK TO QUAD-LOCK WALL - DRIVEWAY

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-212



2 QUAD-DECK PANELS PERPENDICULAR TO QUAD-LOCK WALL
DRIVEWAY CONDITION
Scale: N.T.S.

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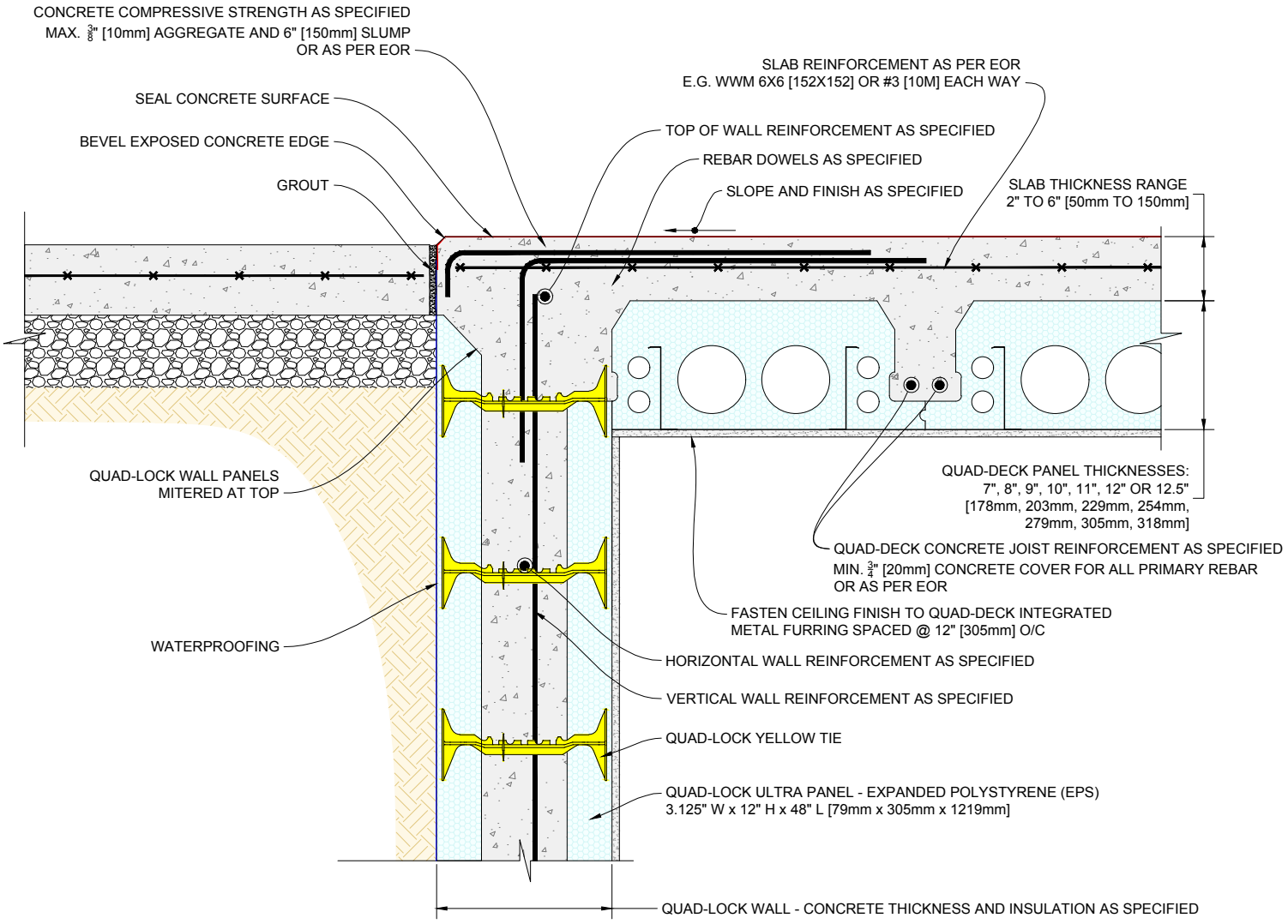
QUAD-DECK TO QUAD-LOCK WALL - DRIVEWAY

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-213



1 QUAD-DECK PANELS PARALLEL TO QUAD-LOCK WALL
DRIVEWAY CONDITION Scale: N.T.S.

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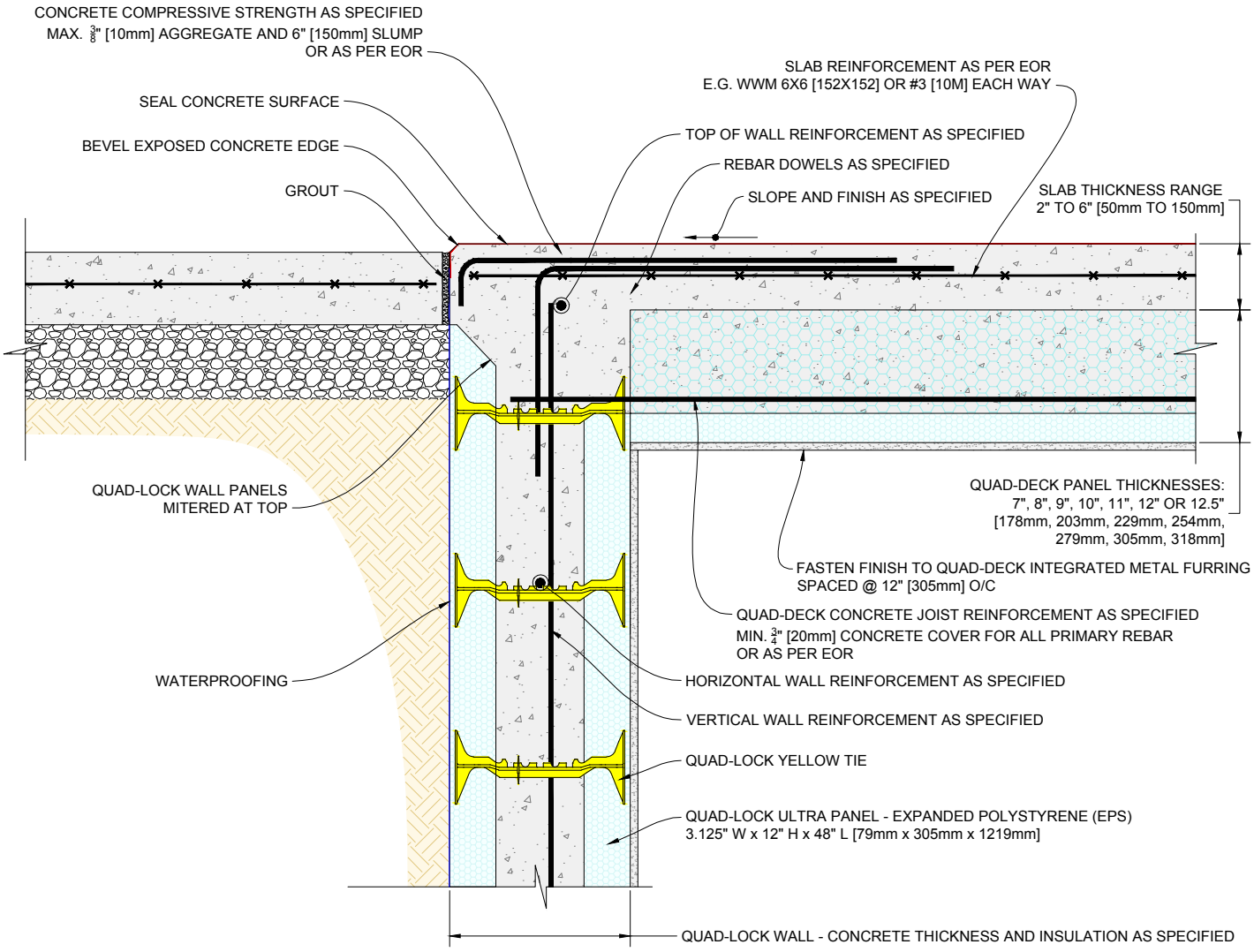
QUAD-DECK TO QUAD-LOCK WALL - DRIVEWAY

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-214



2 QUAD-DECK PANELS PERPENDICULAR TO QUAD-LOCK WALL
DRIVEWAY CONDITION
Scale: N.T.S.

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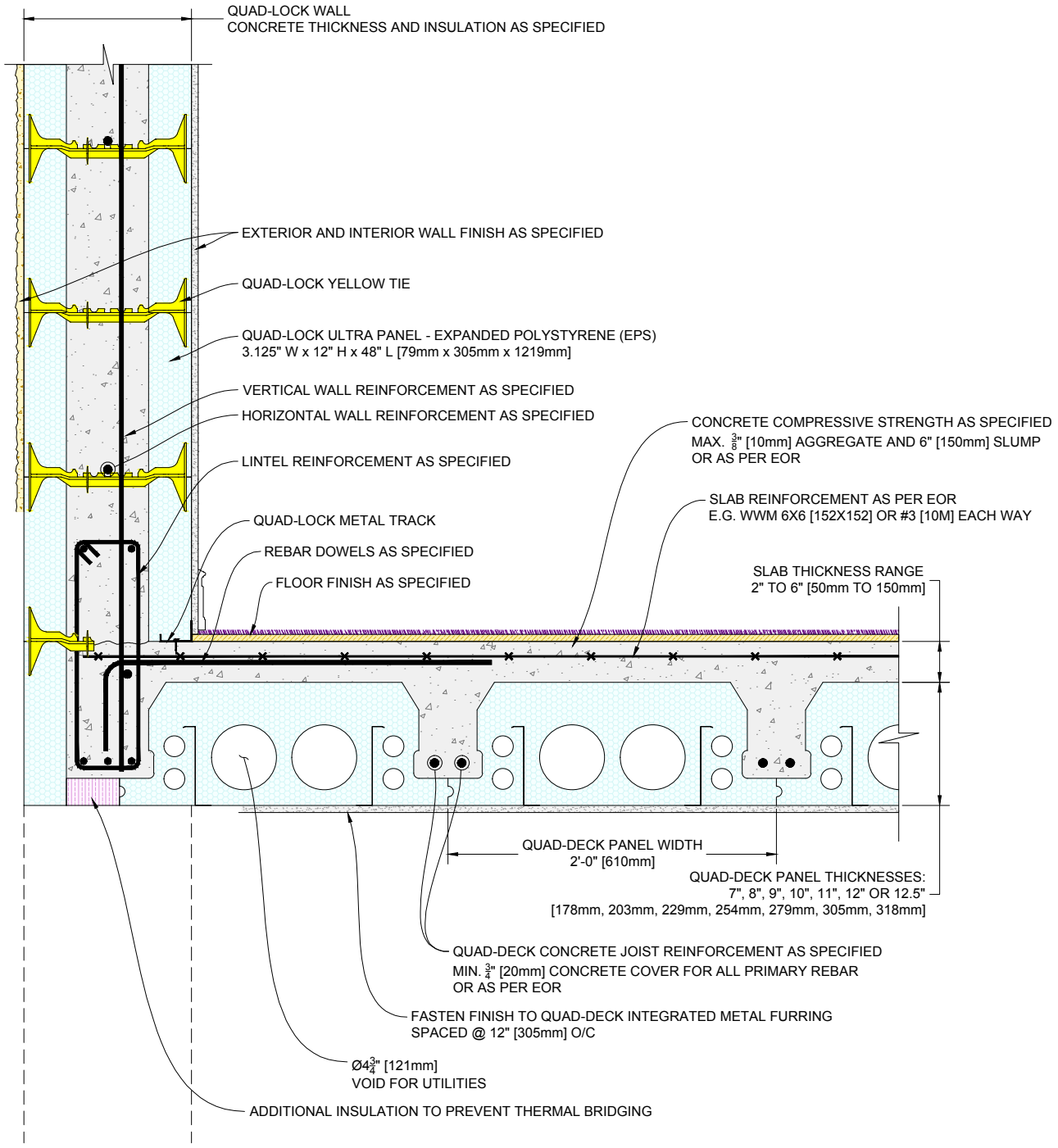
QUAD-DECK TO QUAD-LOCK WALL - DRIVEWAY

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-215



1 QUAD-DECK PANELS PARALLEL TO QUAD-LOCK WALL
FLUSHED HEAD OPENING CONDITION Scale: N.T.S.

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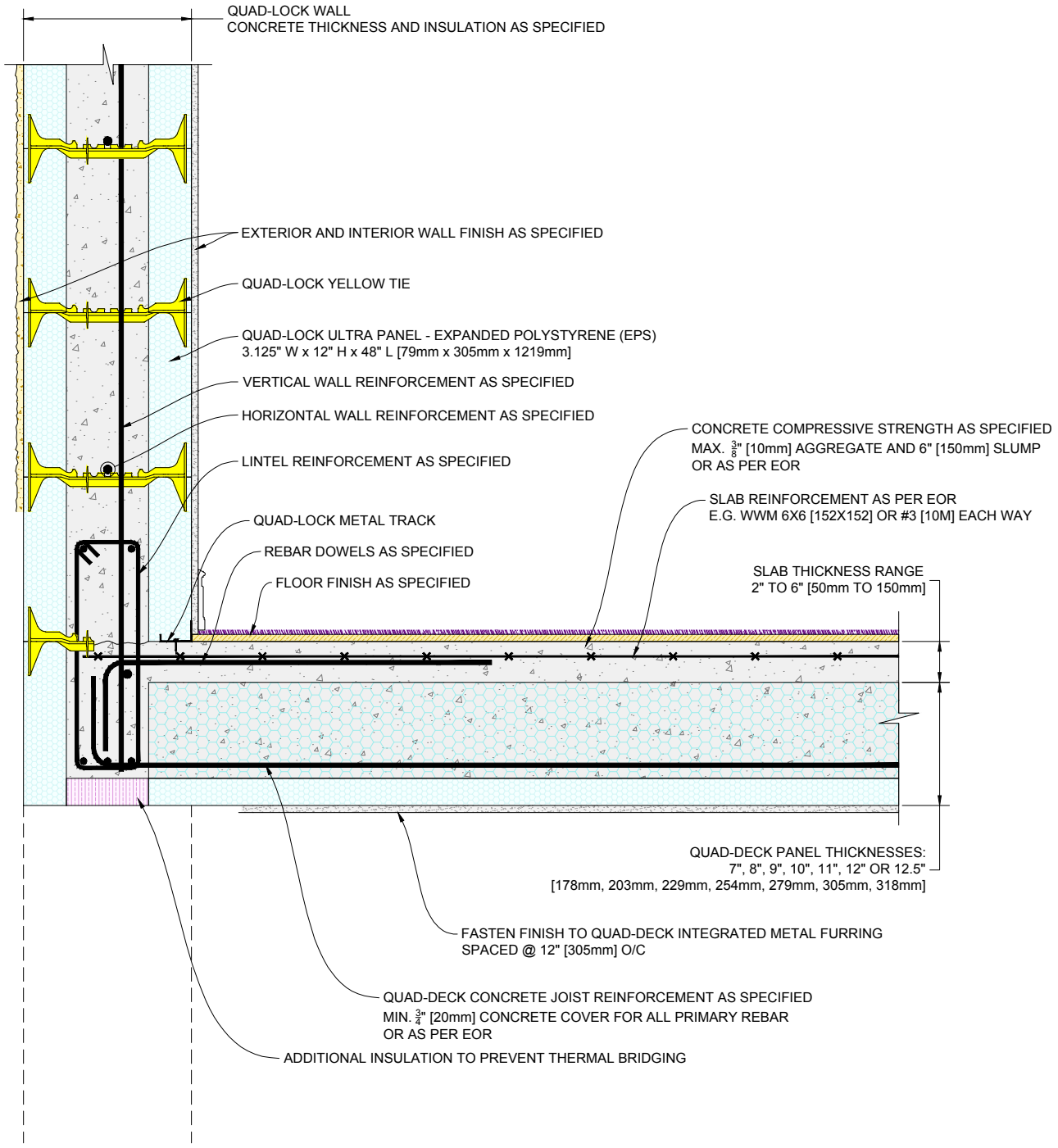
QUAD-DECK TO QUAD-LOCK WALL - OVERHEAD

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-216



2 QUAD-DECK PANELS PERPENDICULAR TO QUAD-LOCK WALL
FLUSHED HEAD OPENING CONDITION Scale: N.T.S.

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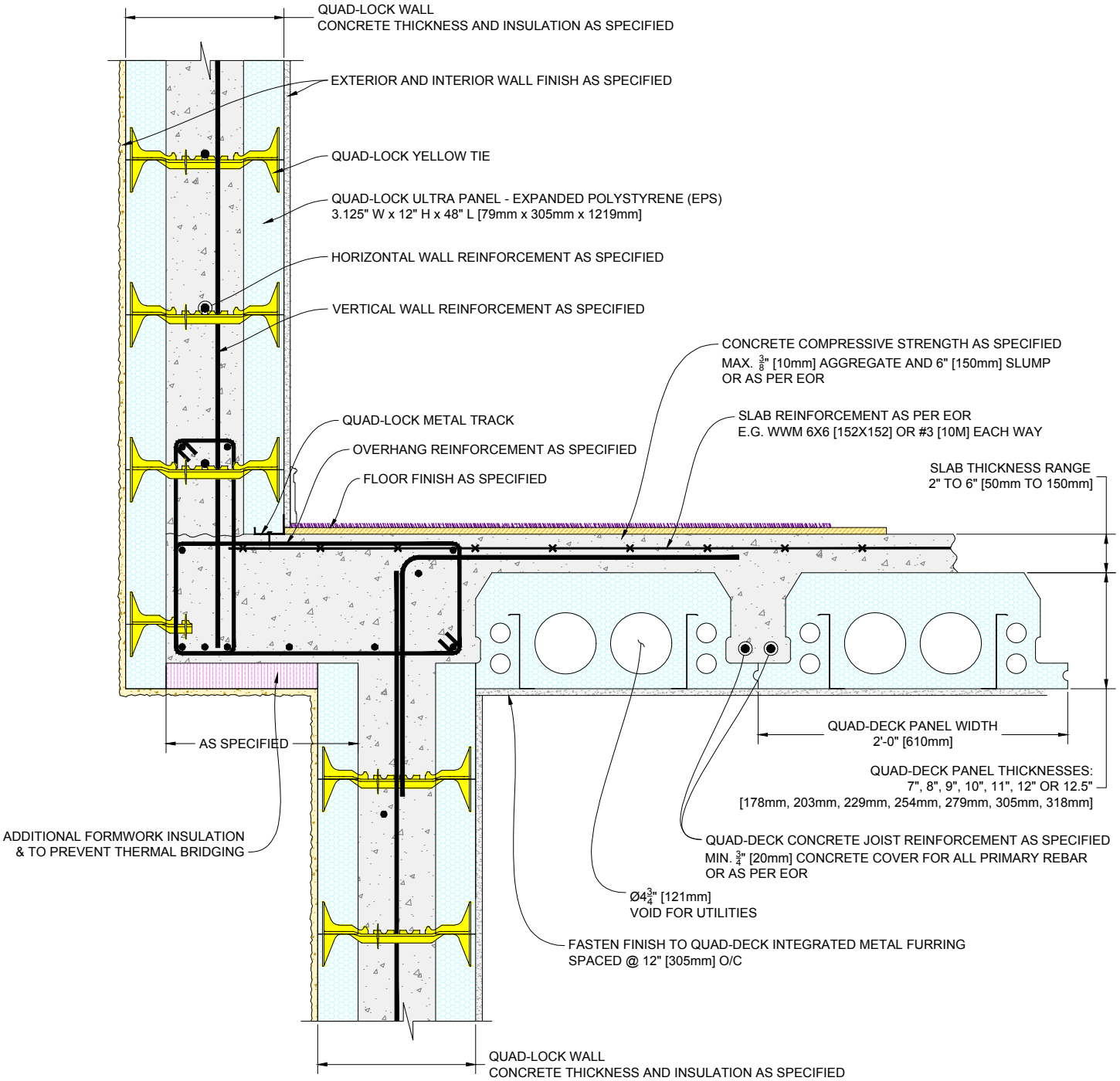
QUAD-DECK TO QUAD-LOCK WALL - OVERHEAD

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-217



1 QUAD-LOCK WALL OFFSET (QUAD-DECK PANELS PARALLEL TO WALL)
EXTERIOR WALL OFFSET CONDITION
Scale: N.T.S.

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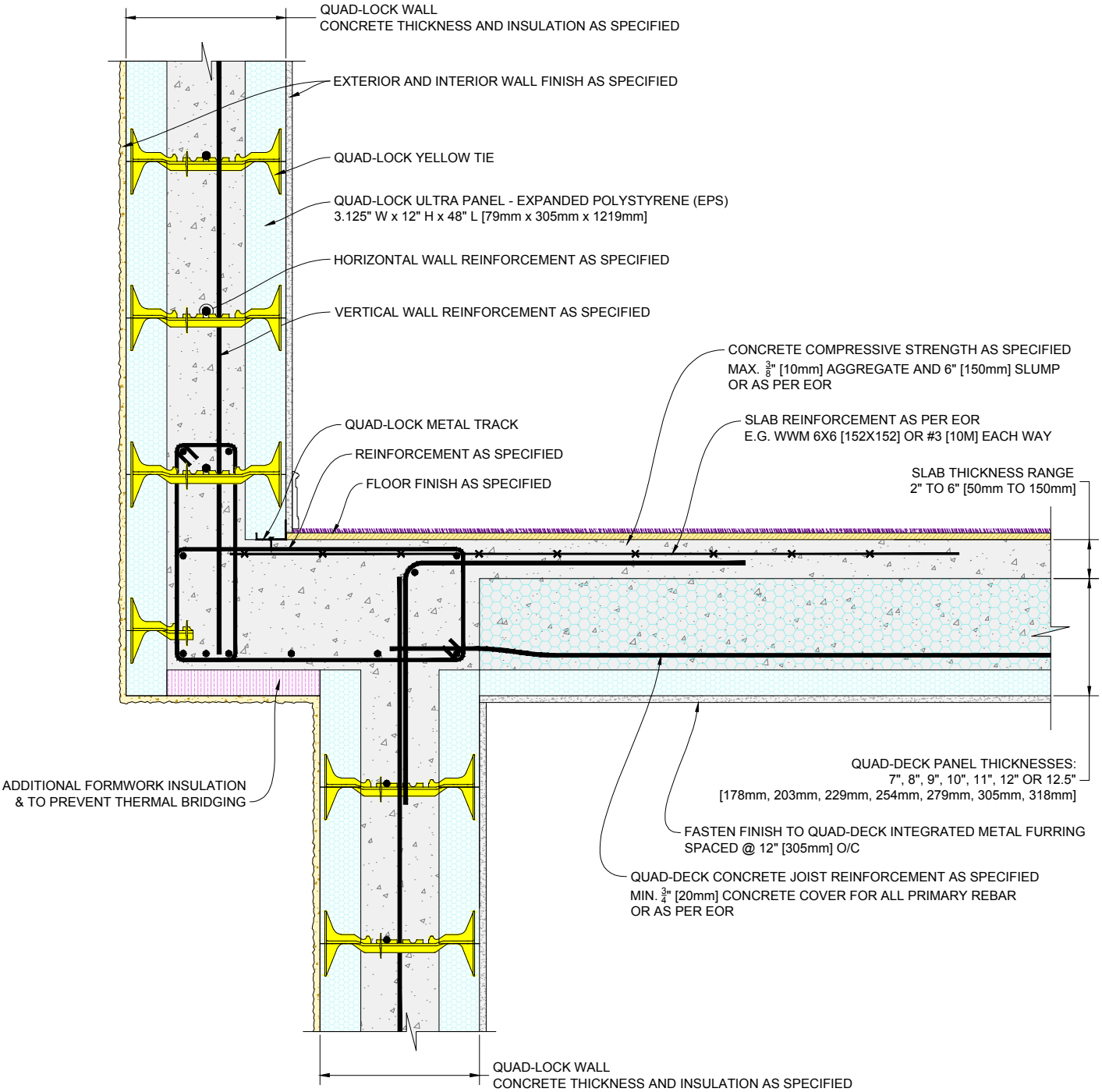
QUAD-DECK TO OFFSET QUAD-LOCK WALL

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-218



1 QUAD-LOCK WALL OFFSET (QUAD-DECK PANELS PERPENDICULAR TO WALL)
EXTERIOR WALL OFFSET CONDITION

Scale: N.T.S.

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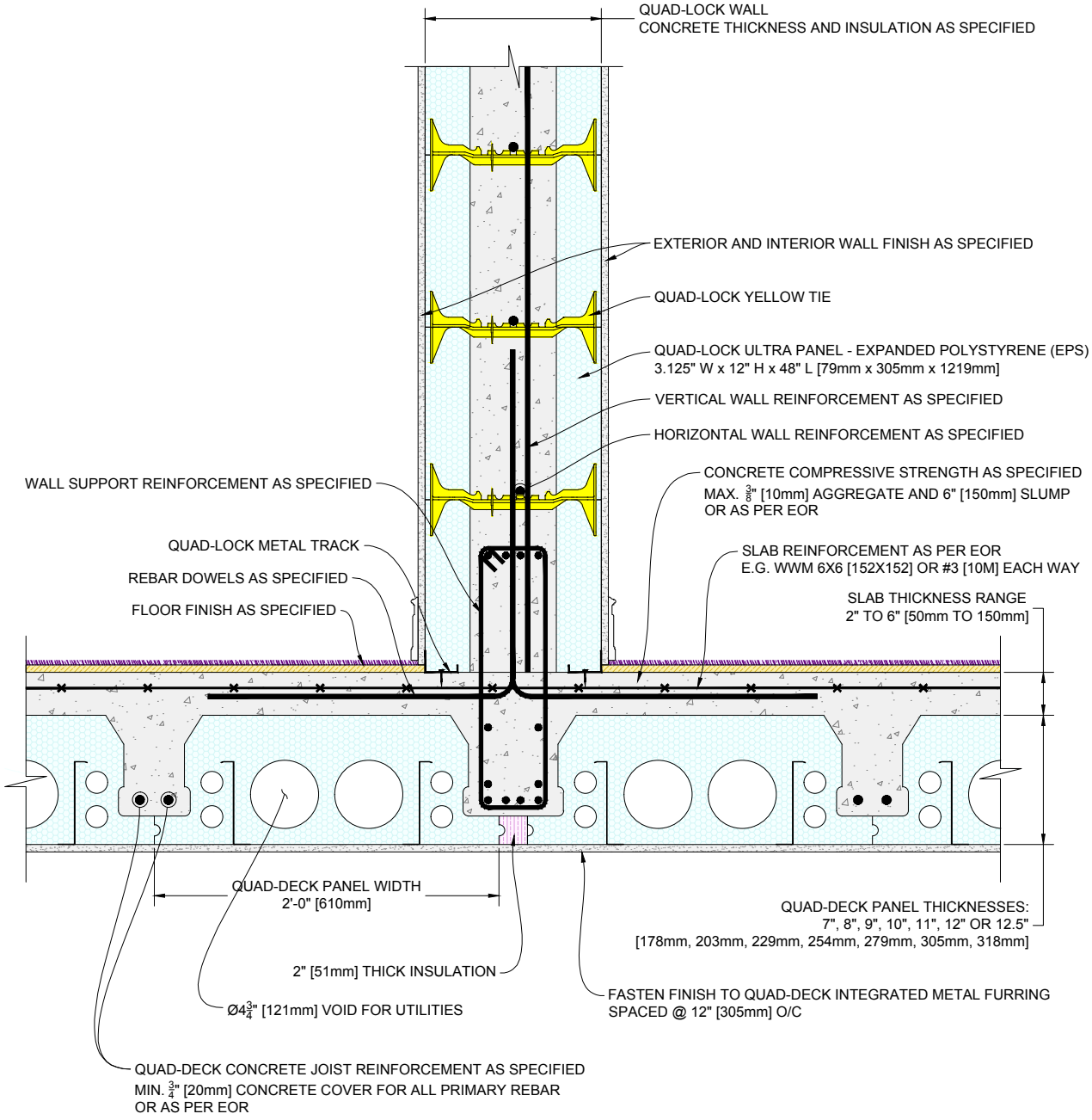
QUAD-DECK TO OFFSET QUAD-LOCK WALL

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-219



1 QUAD-DECK SUPPORTING QUAD-LOCK WALL (PANELS PARALLEL TO WALL)

BEAM IN THE WALL CONDITION

Scale: N.T.S.

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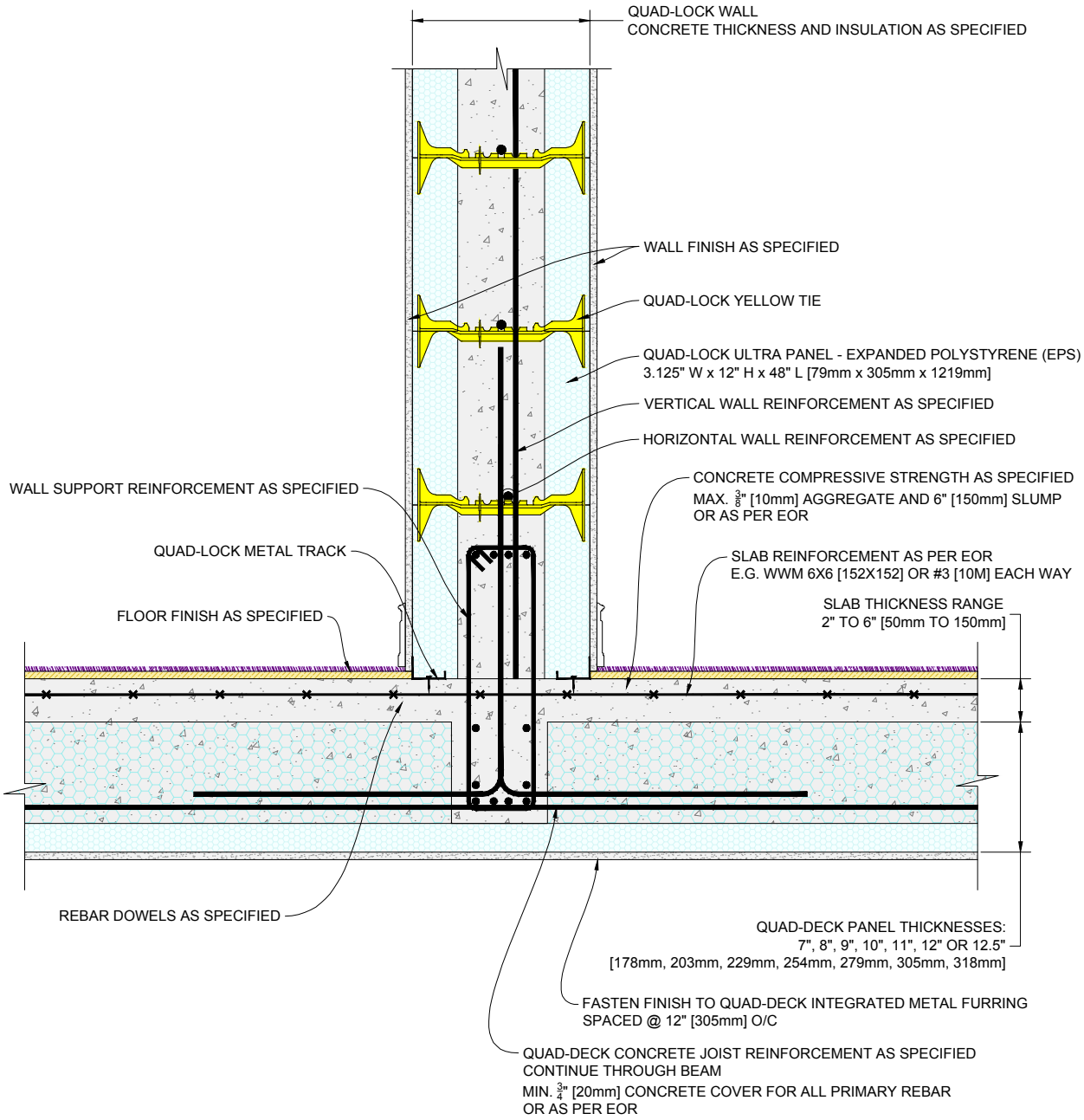
QUAD-DECK WITH SELF-SUPPORTING QUAD-LOCK WALL ON TOP

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-220



1 QUAD-DECK SUPPORTING QUAD-LOCK WALL (PANELS PERPENDICULAR TO WALL)

BEAM IN THE WALL CONDITION

Scale: N.T.S.

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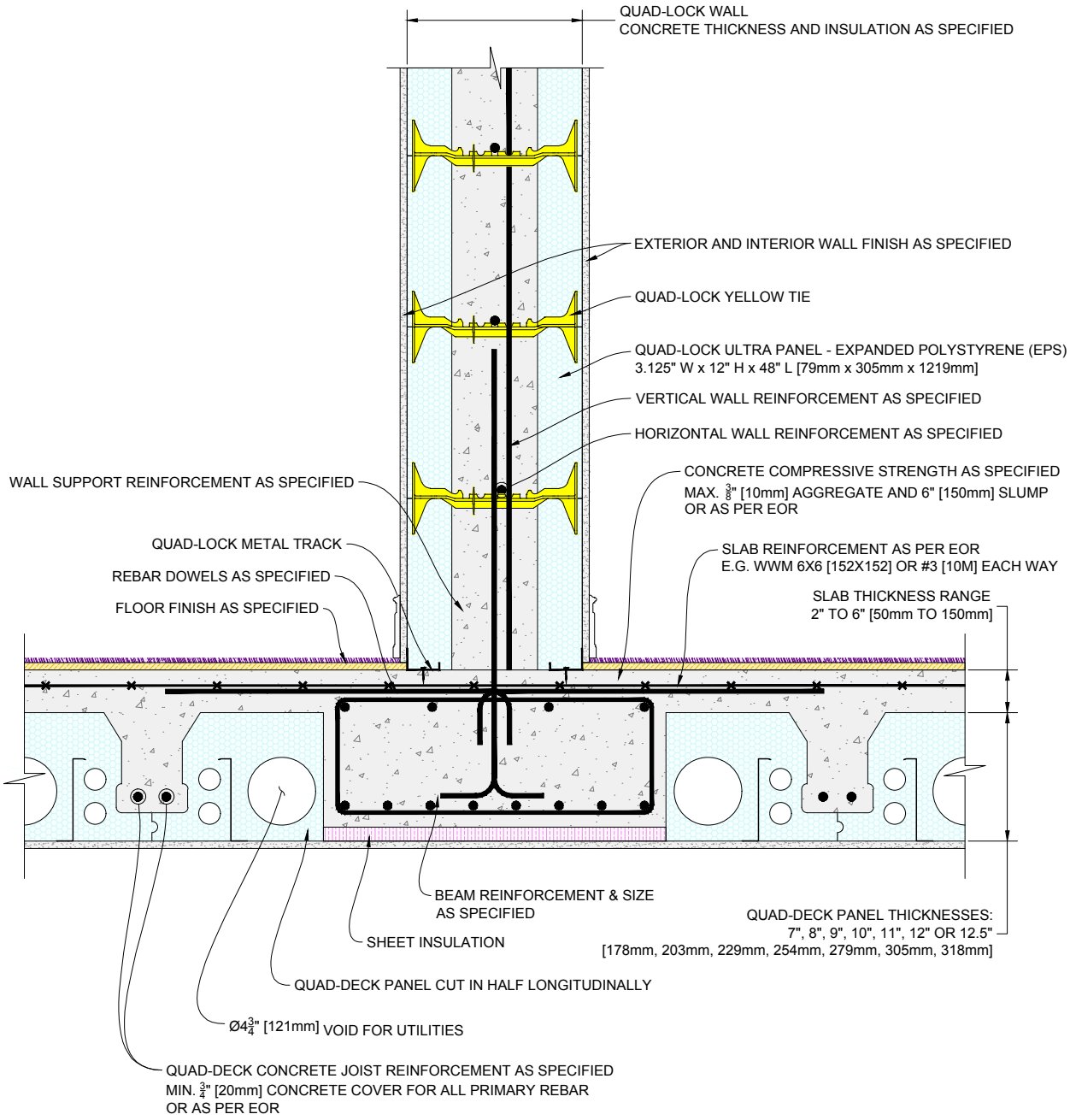
QUAD-DECK WITH SELF-SUPPORTING QUAD-LOCK WALL ON TOP

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-221



1 QUAD-DECK SUPPORTING QUAD-LOCK WALL (PANELS PARALLEL TO WALL)

BEAM IN THE DECK CONDITION

Scale: N.T.S.

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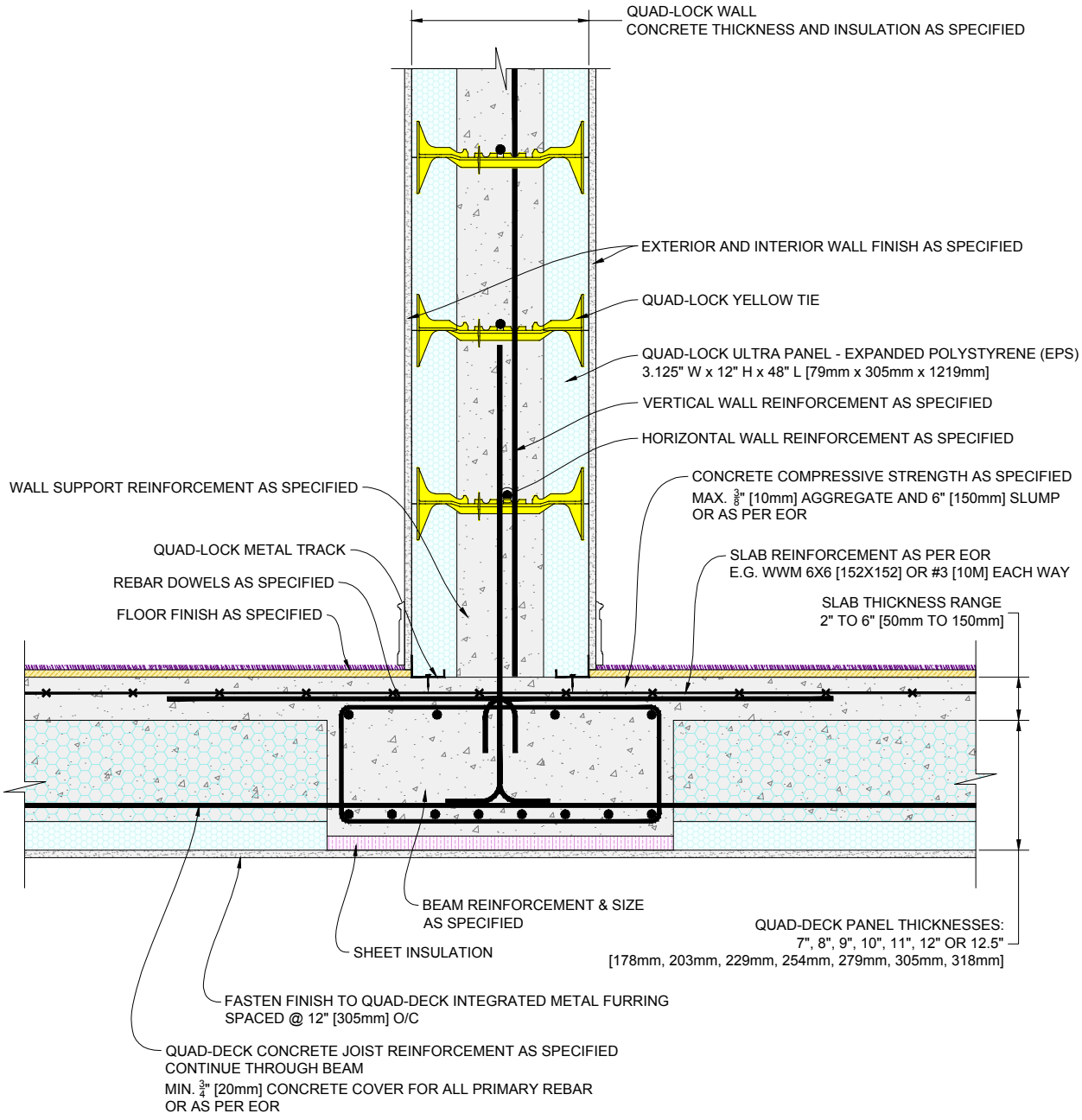
QUAD-DECK SUPPORTING QUAD-LOCK WALL ON TOP

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-222



1 QUAD-DECK SUPPORTING QUAD-LOCK WALL (PANELS PERPENDICULAR TO WALL)

BEAM IN THE DECK CONDITION

Scale: N.T.S.

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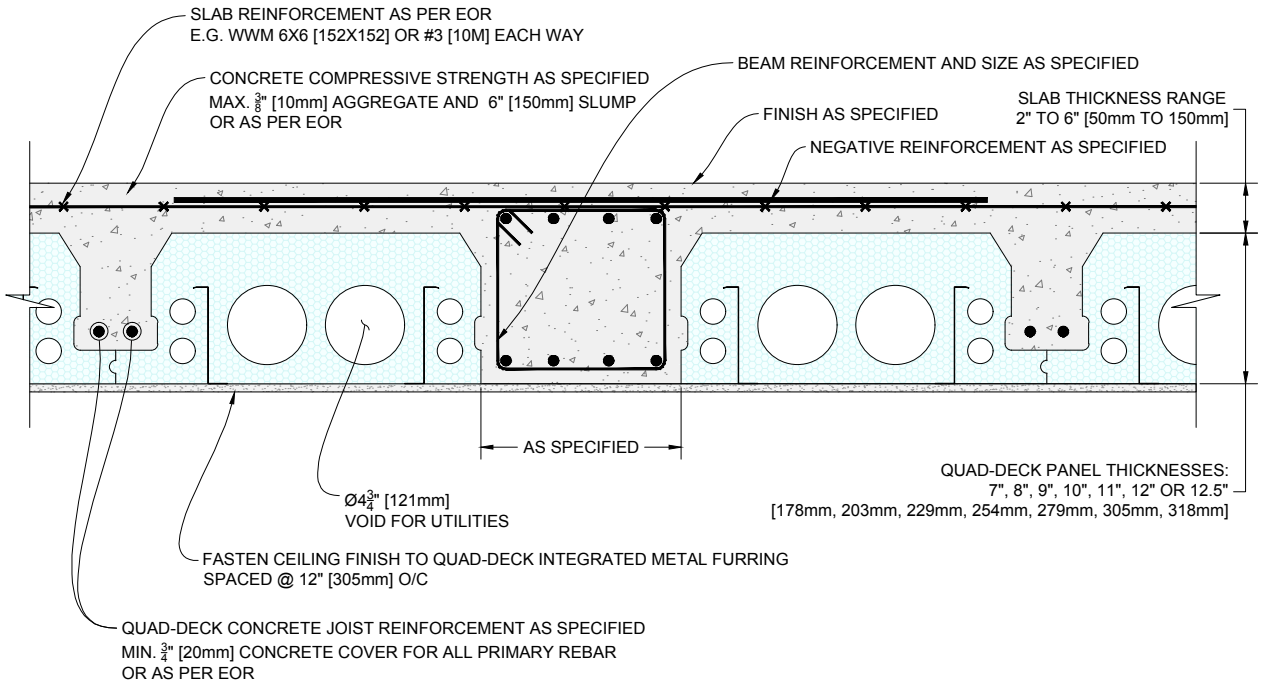
QUAD-DECK SUPPORTING QUAD-LOCK WALL ON TOP

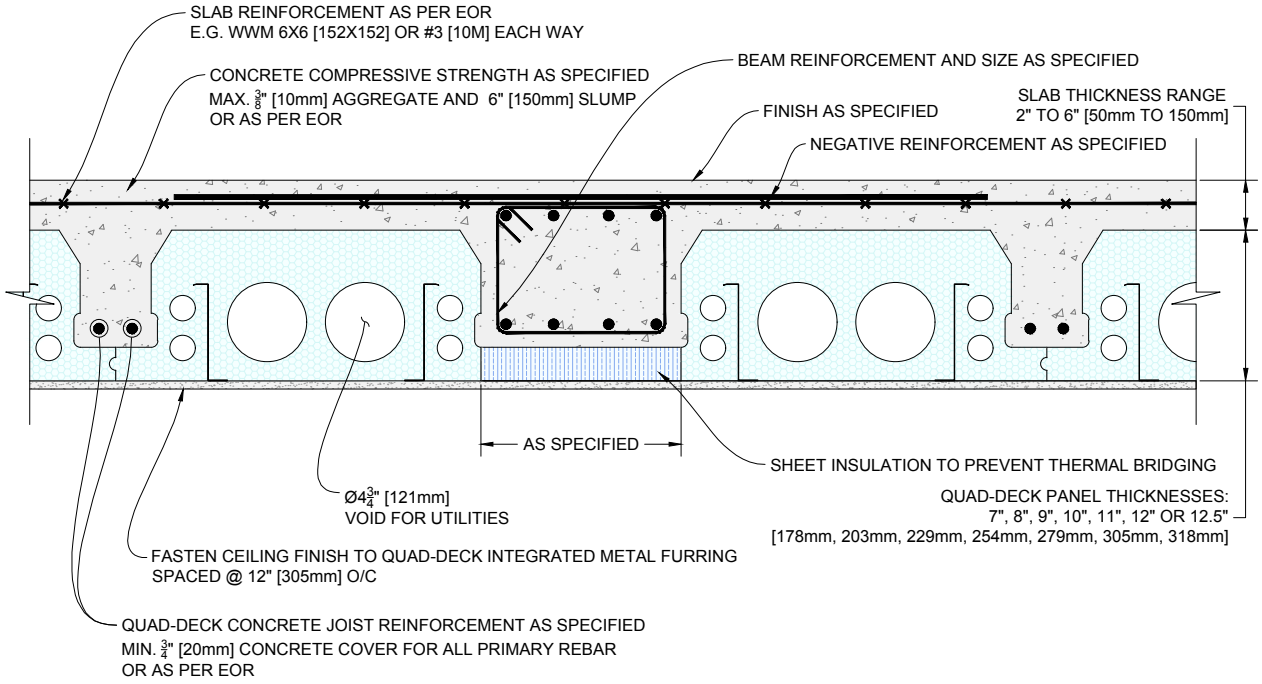
DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-223



1 QUAD-DECK FLUSHED BEAM DETAIL (Panels Parallel to Beam)

Scale: N.T.S.



2 QUAD-DECK FLUSHED BEAM DETAIL (Panels Parallel to Beam)
WITH THERMAL BREAK INSULATION

Scale: N.T.S.

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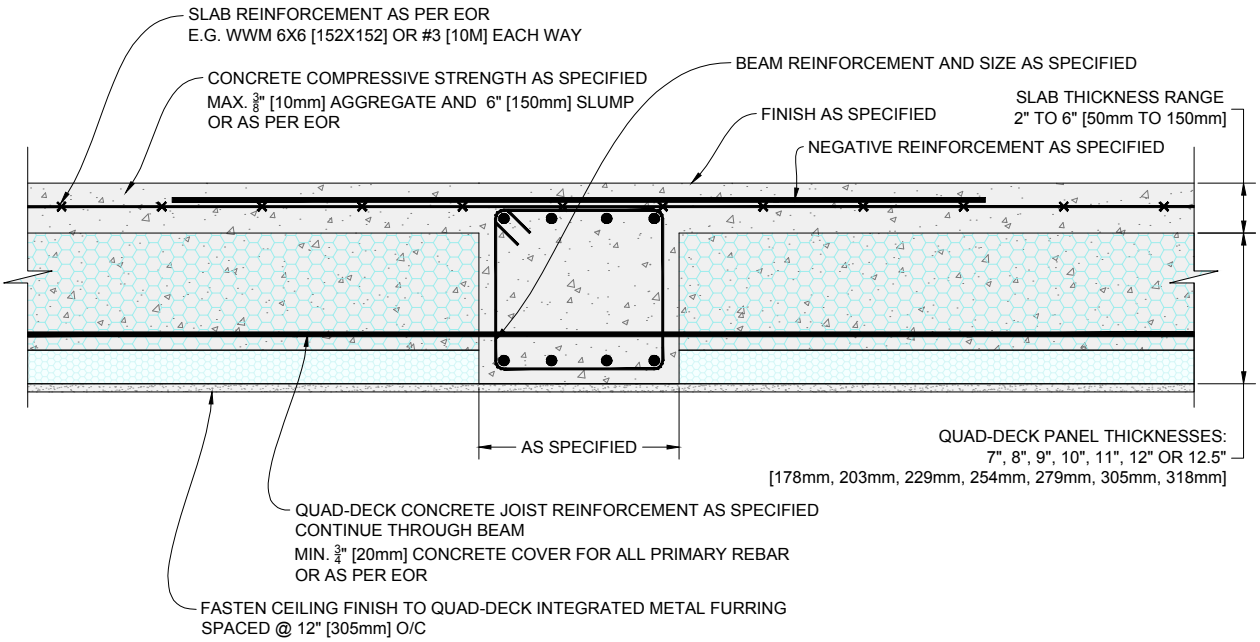
QUAD-DECK TO CONCRETE BEAM DETAIL

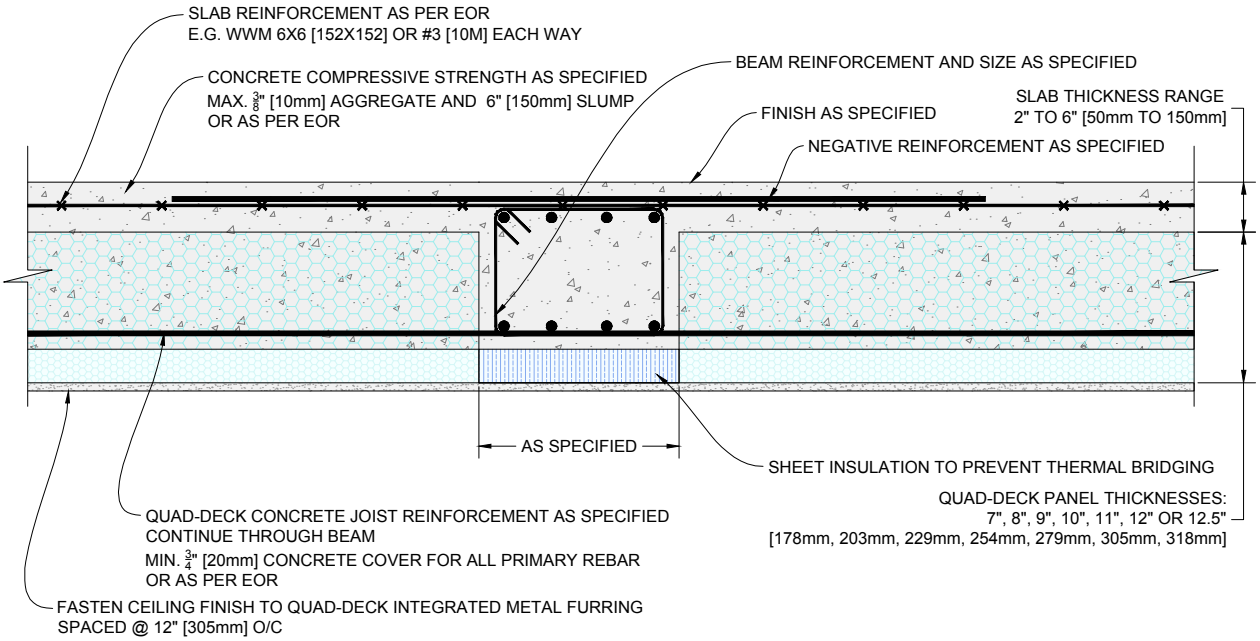
DATE DRAWN:	2015-05-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-300



1 QUAD-DECK FLUSHED BEAM DETAIL (Panels Perpendicular to Beam)

Scale: N.T.S.



2 QUAD-DECK FLUSHED BEAM DETAIL (Panels Perpendicular to Beam)

WITH THERMAL BREAK INSULATION

Scale: N.T.S.

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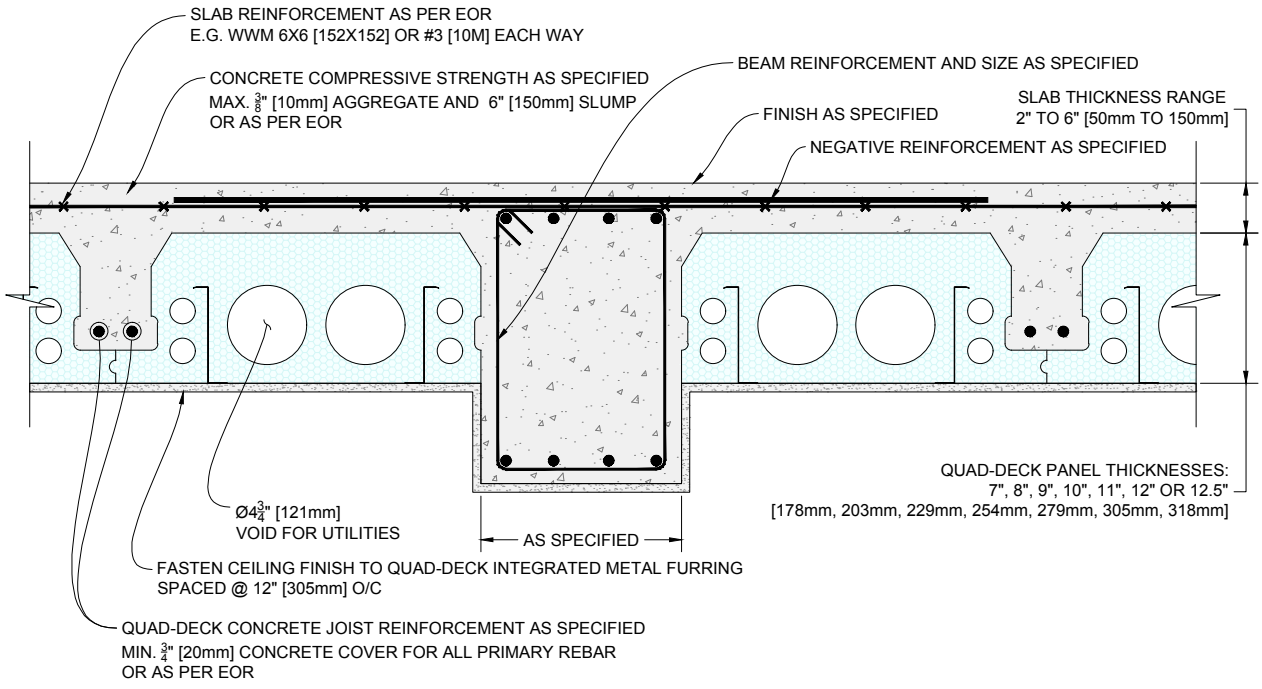
QUAD-DECK TO CONCRETE BEAM DETAIL

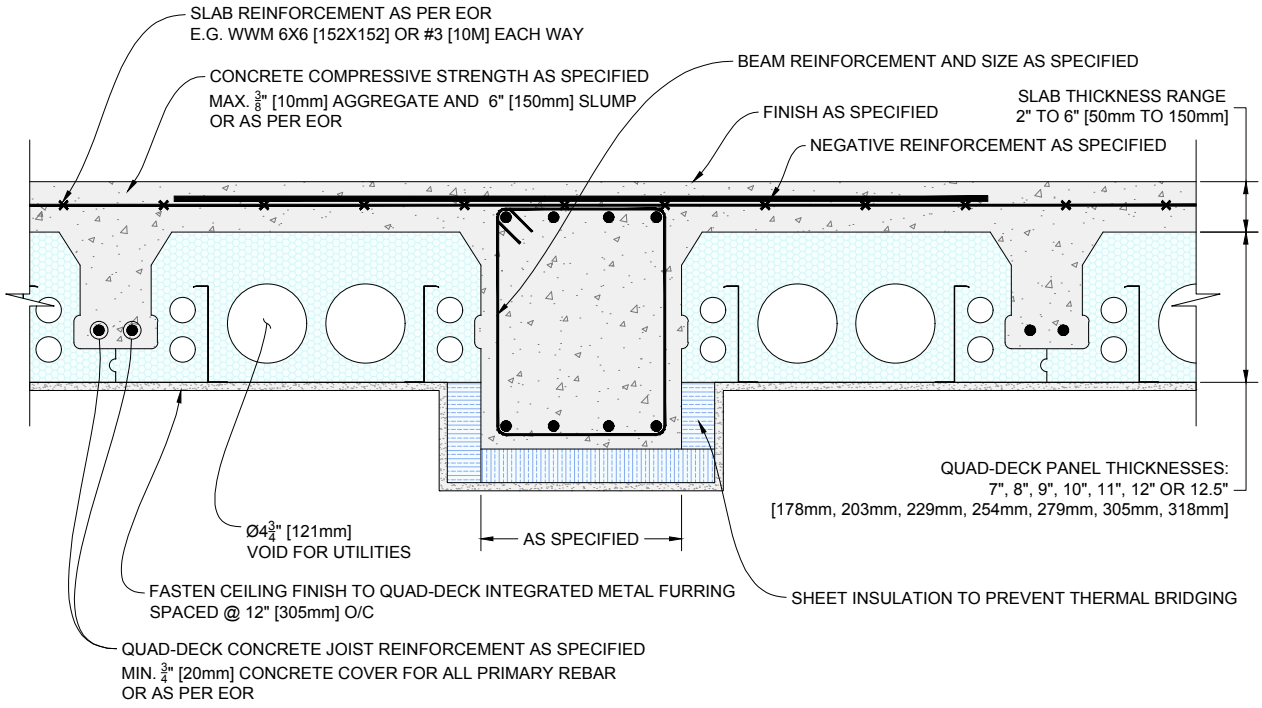
DATE DRAWN:	2015-05-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-301



1 QUAD-DECK DROPPED BEAM DETAIL (Panels Parallel to Beam)

Scale: N.T.S.



2 QUAD-DECK DROPPED BEAM DETAIL (Panels Parallel to Beam)
WITH THERMAL BREAK INSULATION

Scale: N.T.S.

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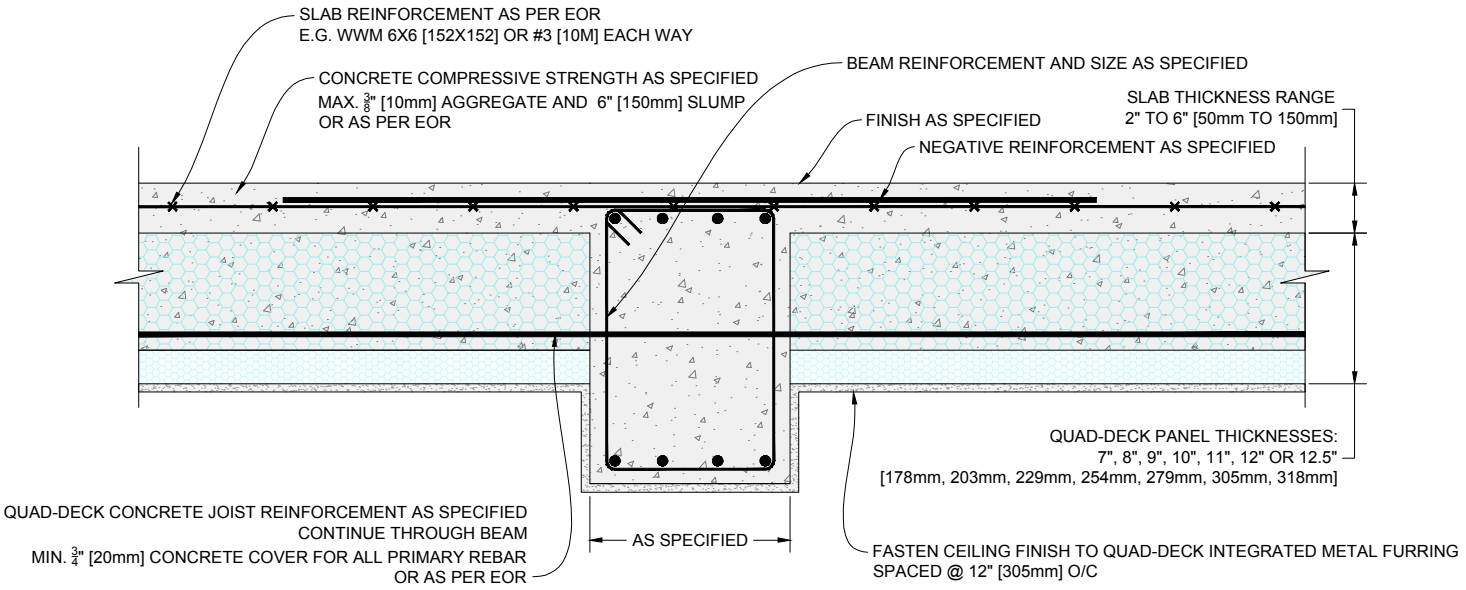
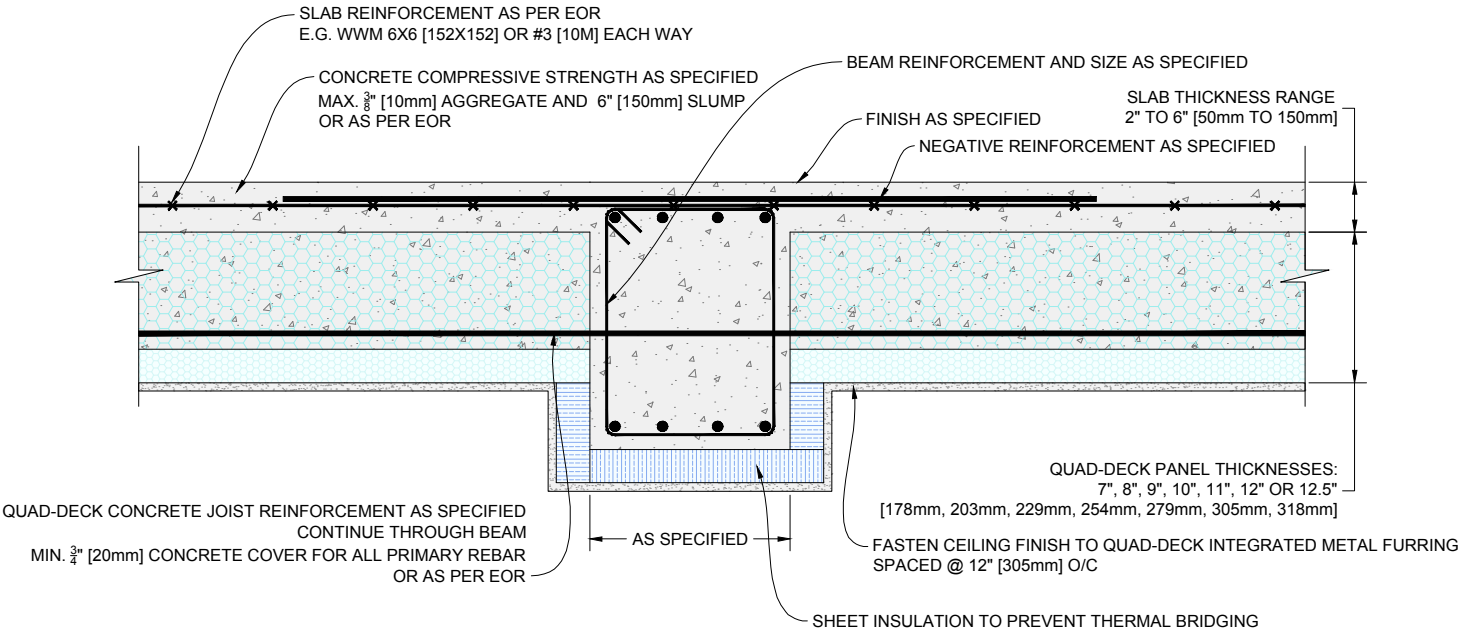
QUAD-DECK TO CONCRETE BEAM DETAIL

DATE DRAWN: 2015-05-15		COMMENTS: N/A	
REVISION NO: YYYY-MM-DD		SHEET SIZE: 8.5" x 11" [216mm x 279mm]	
REVISION DATE: N/A		SCALE: NOT TO SCALE	DRAWING NO: QD-302
DRAWN BY: Z. PROSTRAN		APPROVED BY: G. KUSTERMANN	



1 QUAD-DECK DROPPED BEAM DETAIL (Panels Perpendicular to Beam)

Scale: N.T.S.



2 QUAD-DECK DROPPED BEAM DETAIL (Panels Perpendicular to Beam)

WITH THERMAL BREAK INSULATION

Scale: N.T.S.

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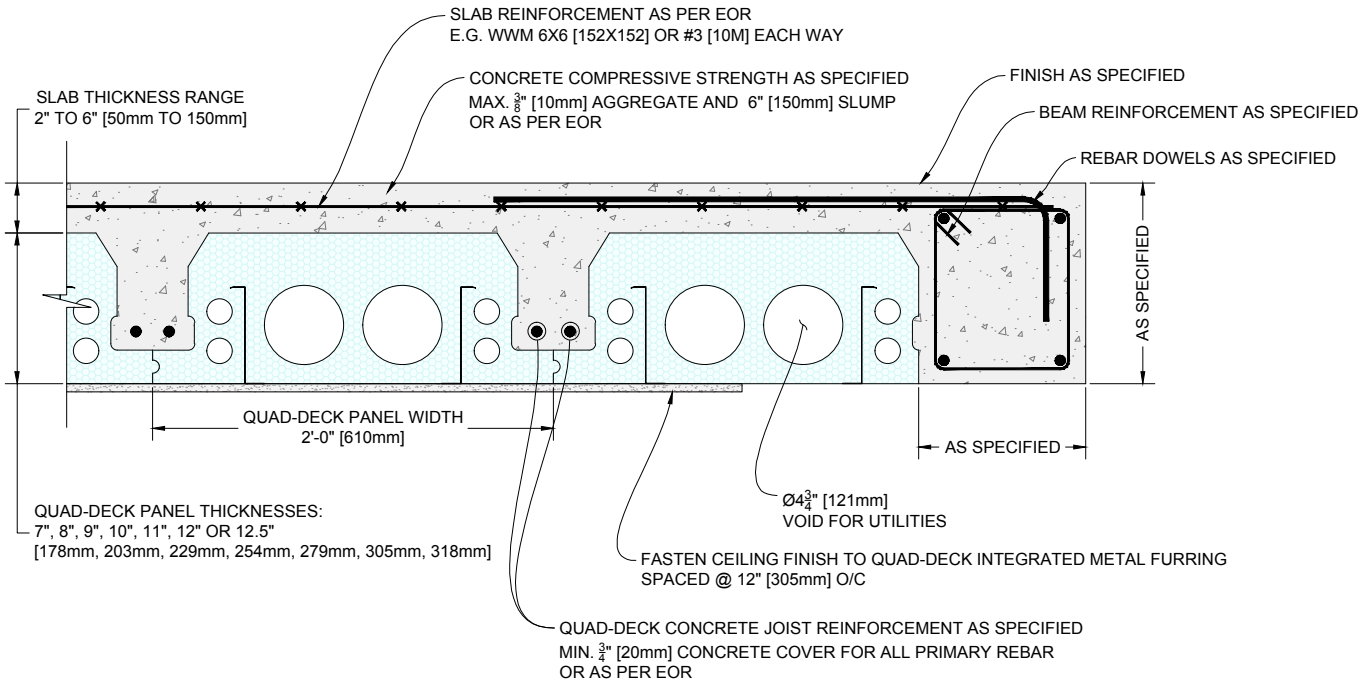
QUAD-DECK TO CONCRETE BEAM DETAIL

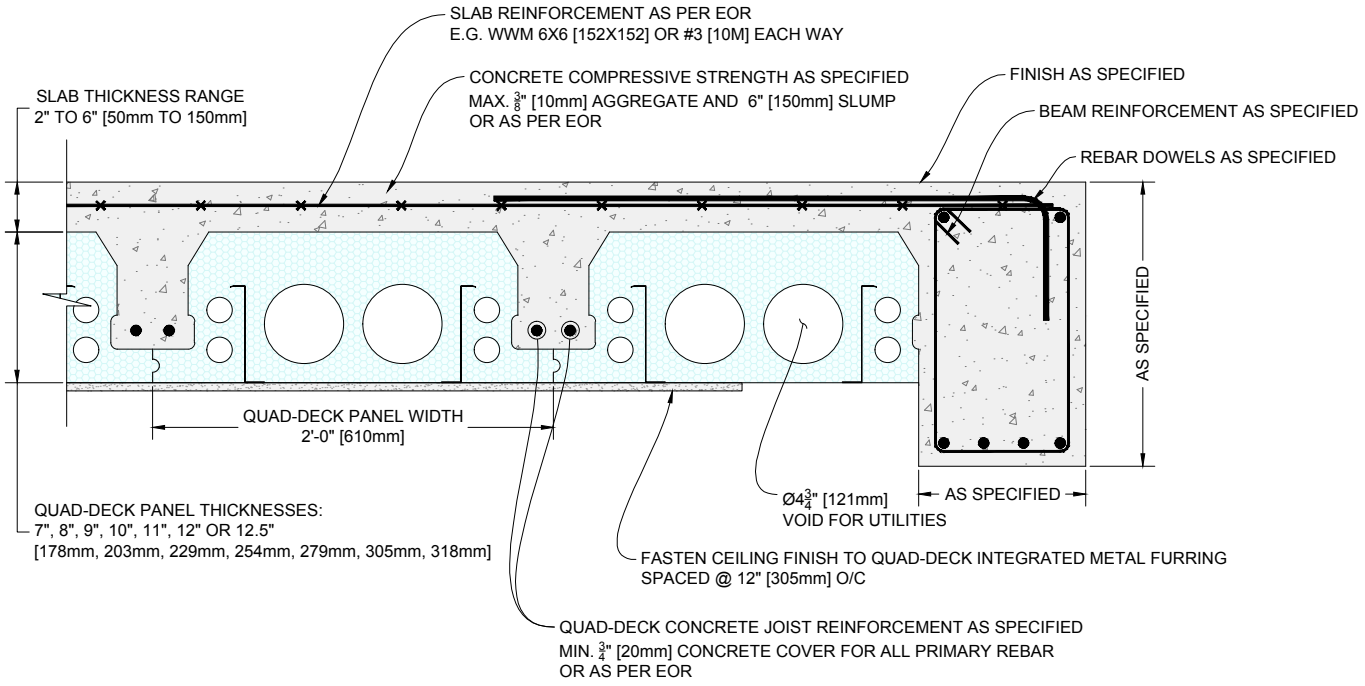
DATE DRAWN:	2015-05-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-303



1 QUAD-DECK FLUSHED PERIMETER BEAM DETAIL (Panels Parallel to Beam)

Scale: N.T.S.



2 QUAD-DECK DROPPED BEAM DETAIL (Panels Parallel to Beam)

Scale: N.T.S.

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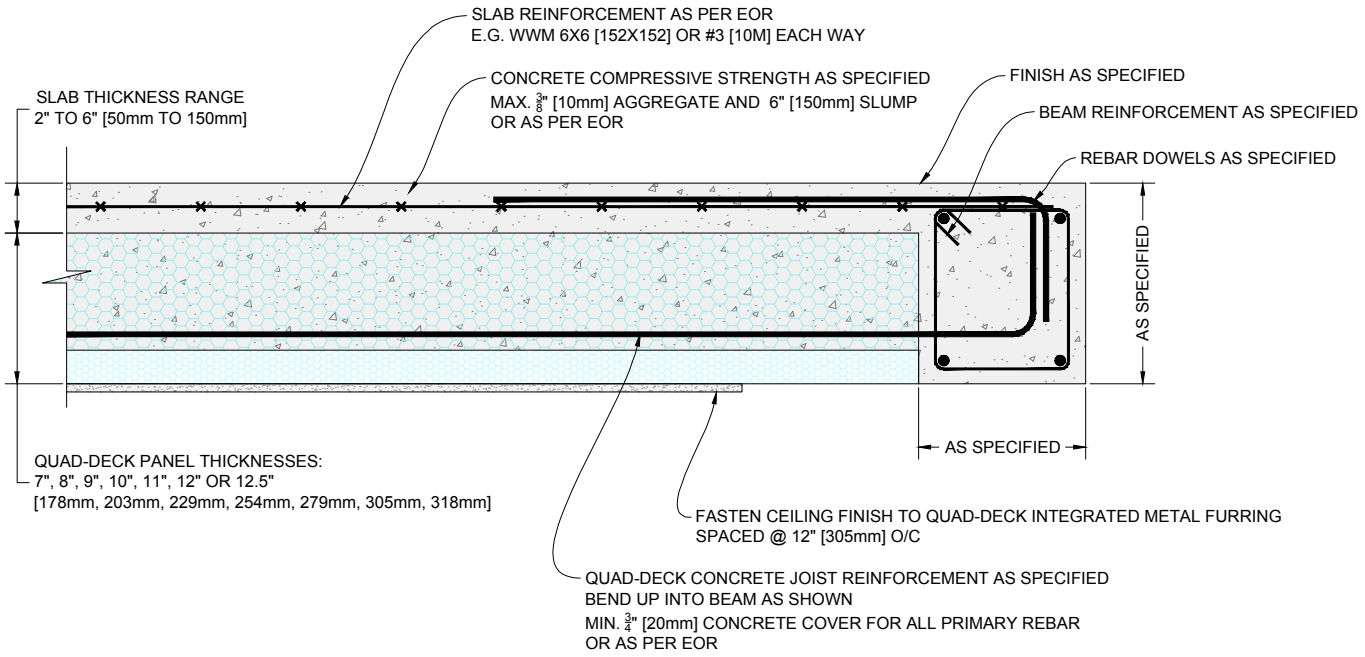
QUAD-DECK TO CONCRETE BEAM DETAIL

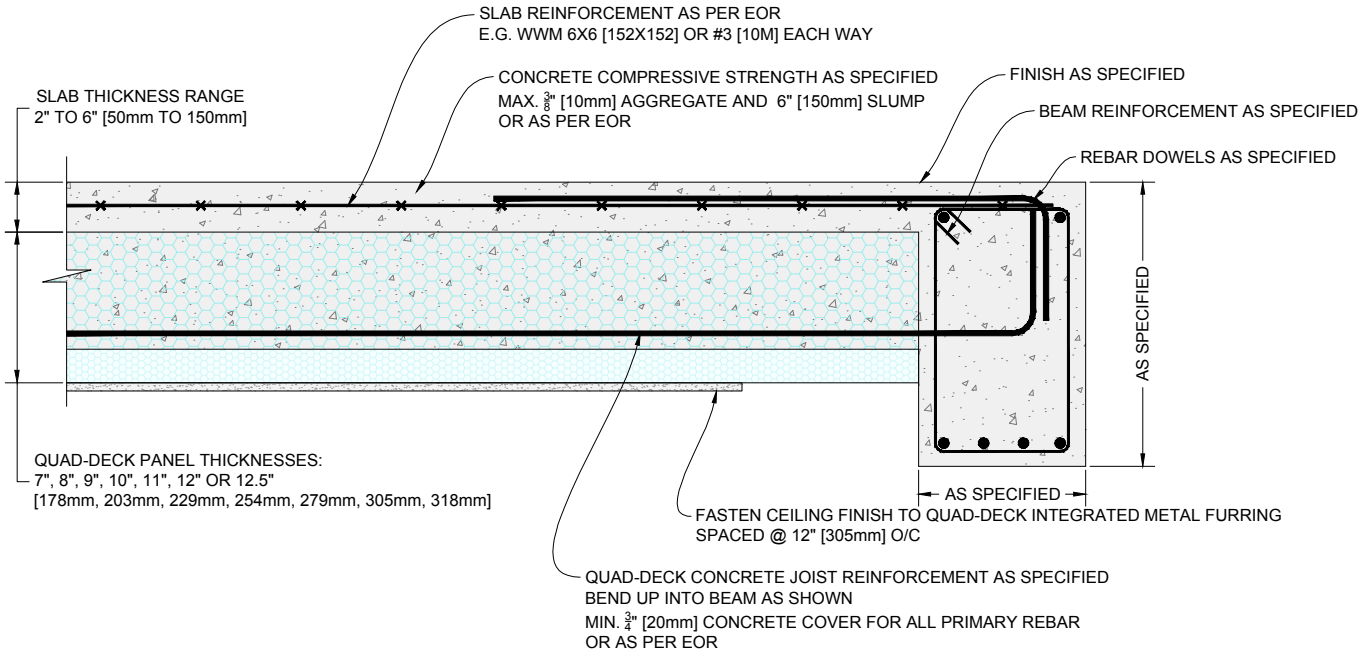
DATE DRAWN:	2015-05-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-304



1 QUAD-DECK FLUSHED PERIMETER BEAM DETAIL (Panels Perpendicular to Beam)

Scale: N.T.S.



2 QUAD-DECK DROPPED BEAM DETAIL (Panels Perpendicular to Beam)

Scale: N.T.S.

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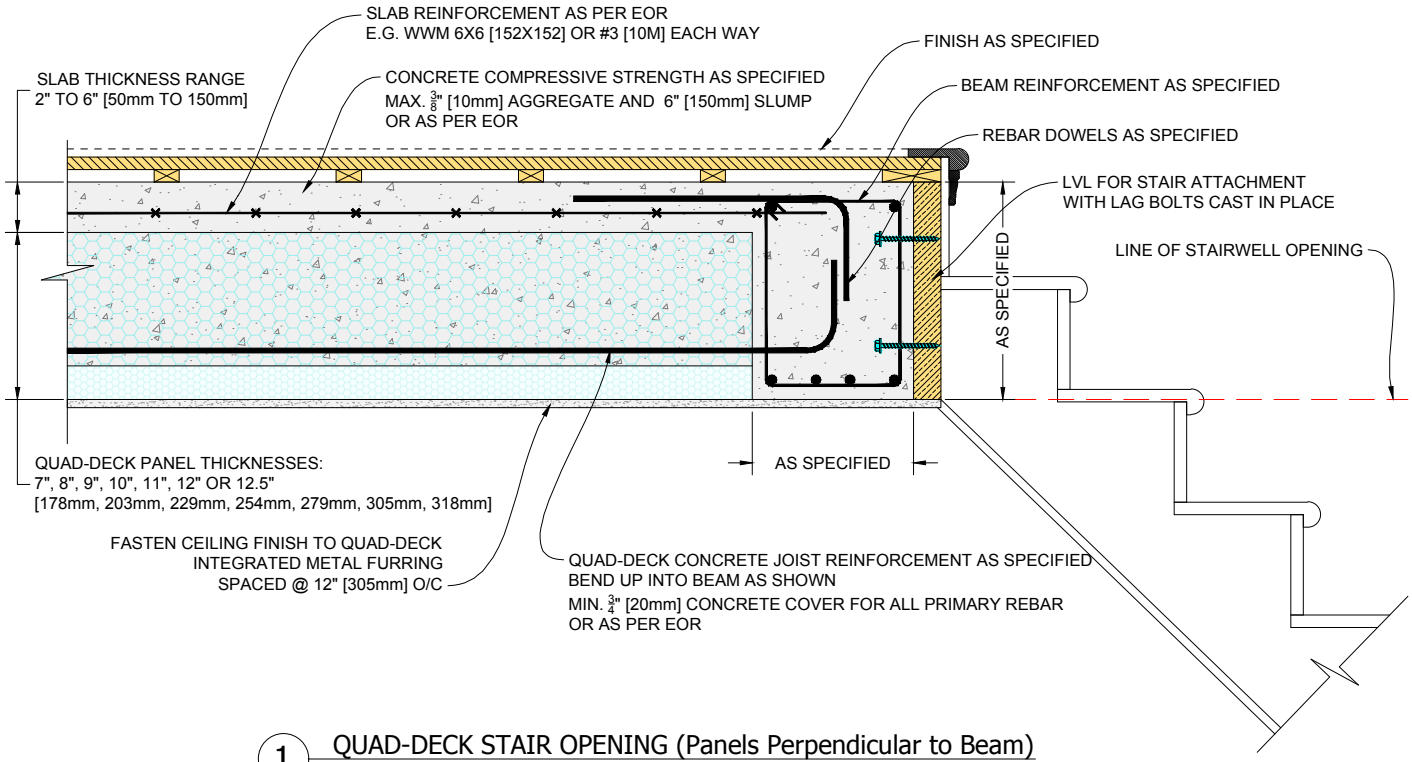
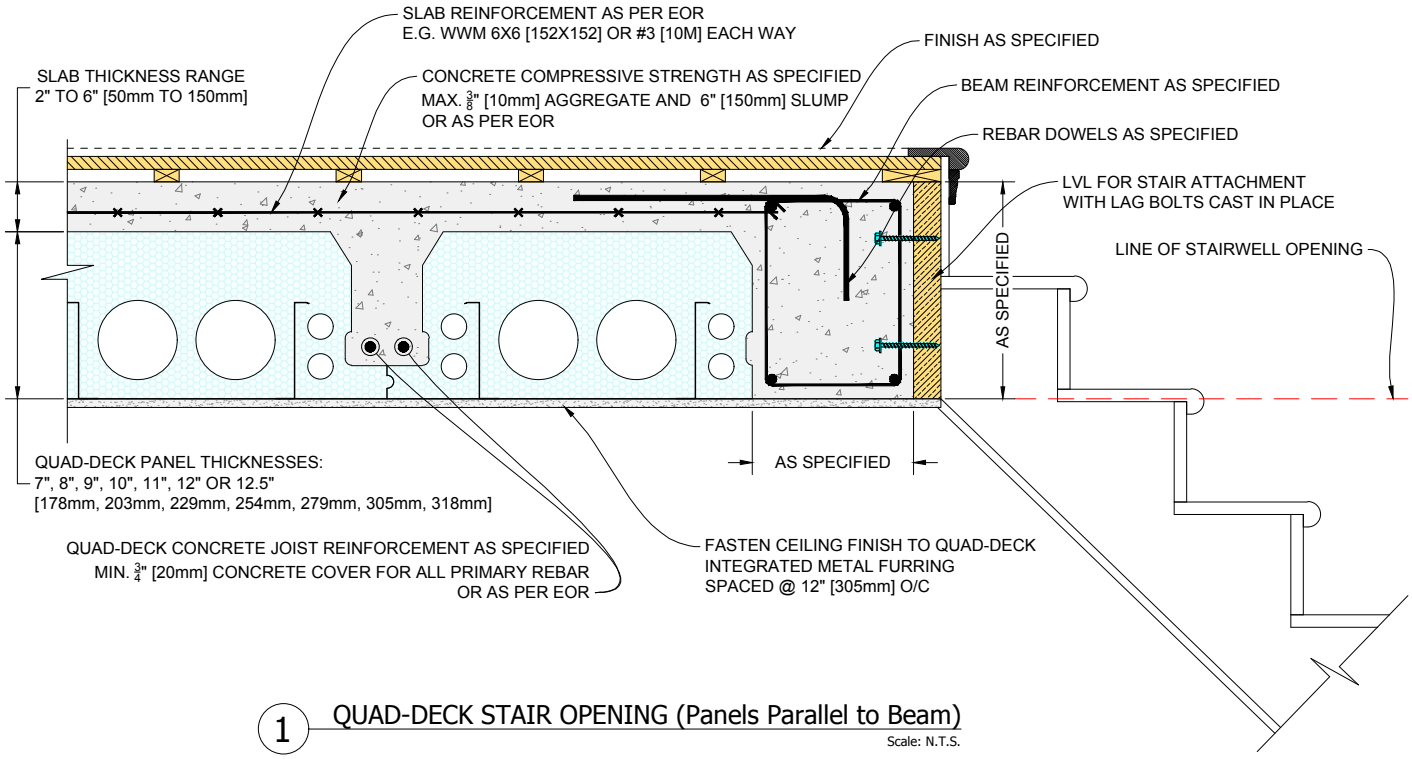
QUAD-DECK TO CONCRETE BEAM DETAIL

DATE DRAWN:	2015-05-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN
		DRAWING NO:	QD-305



1 QUAD-DECK STAIR OPENING (Panels Perpendicular to Beam)

Scale: N.T.S.



1 QUAD-DECK STAIR OPENING (Panels Parallel to Beam)

Scale: N.T.S.

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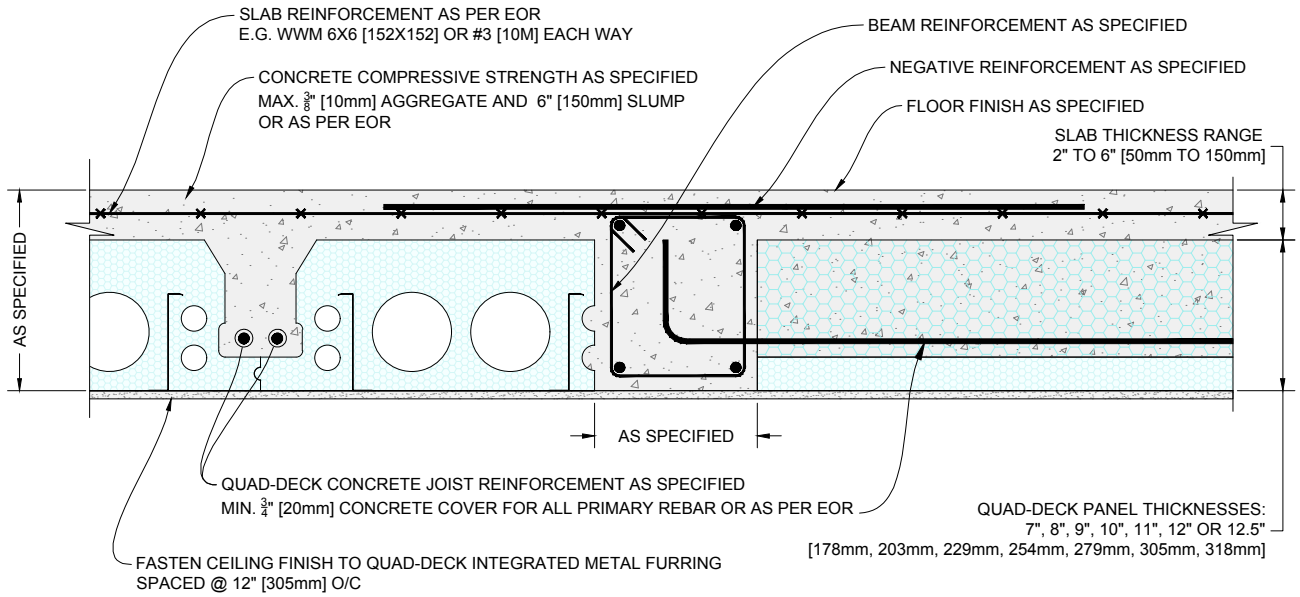
QUAD-DECK TO CONCRETE BEAM DETAIL

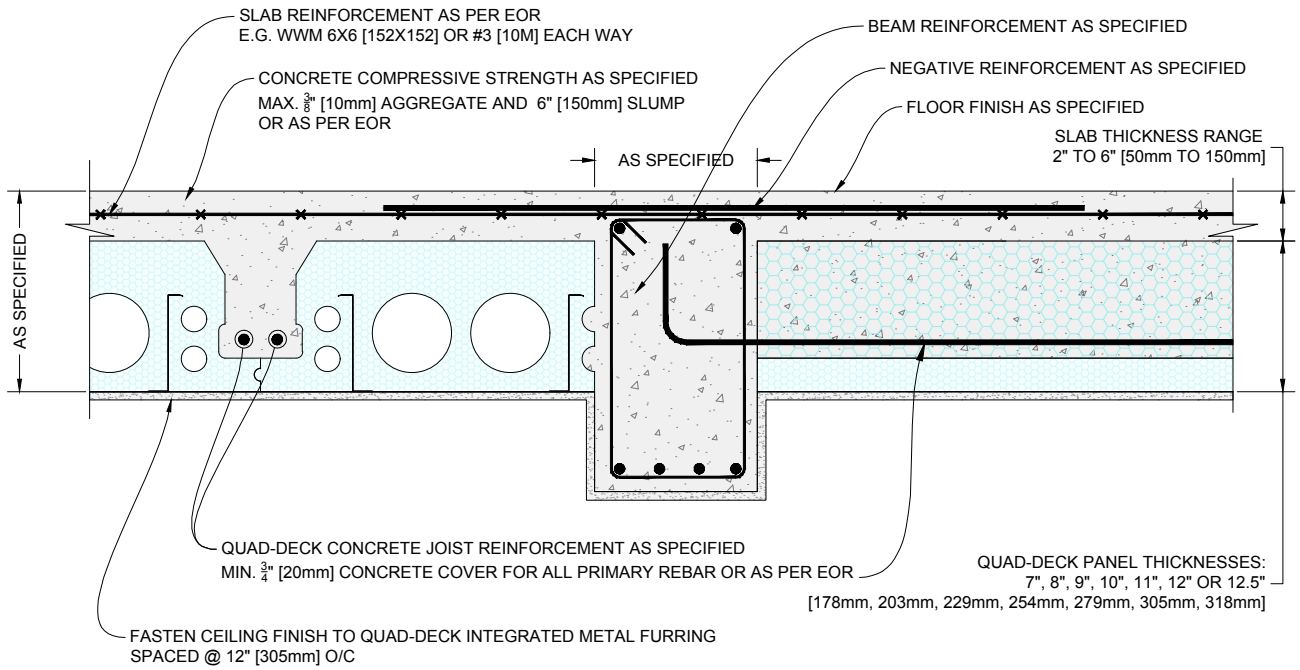
DATE DRAWN:	2015-05-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-306



1 QUAD-DECK FLUSHED BEAM DETAIL (Panels running in both directions)

Scale: N.T.S.



1 QUAD-DECK DROPPED BEAM DETAIL (Panels running in both directions)

Scale: N.T.S.

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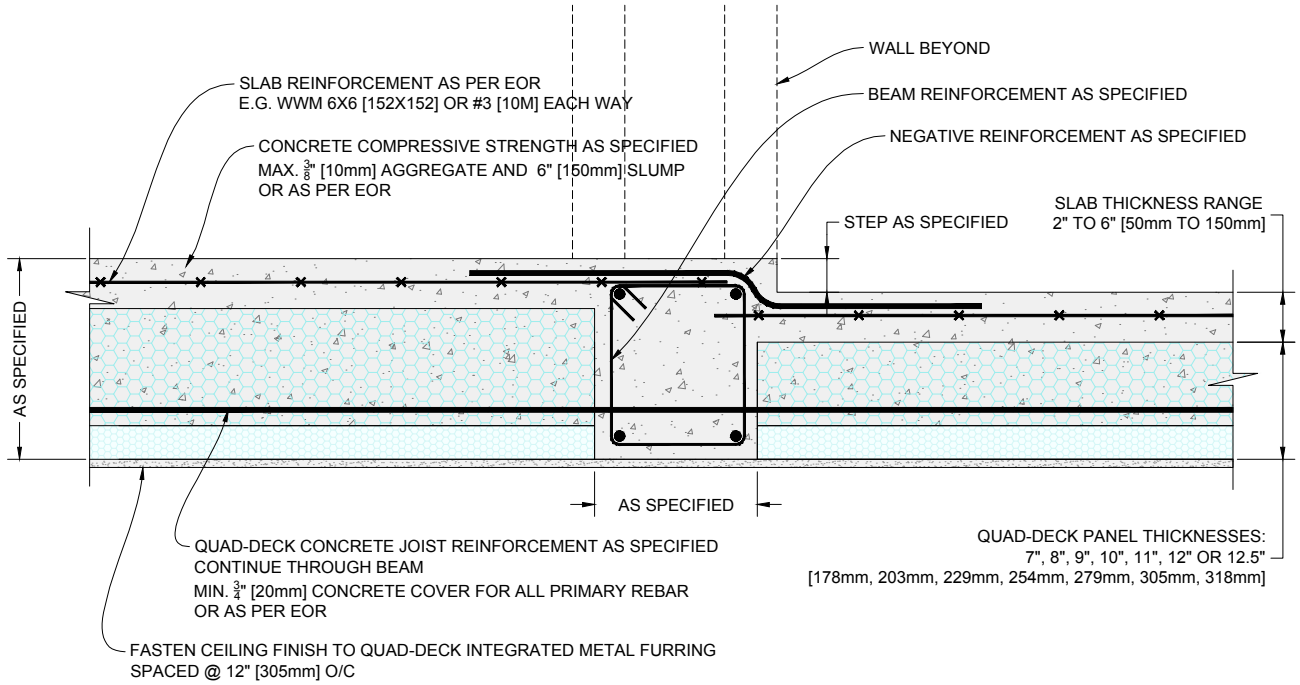
QUAD-DECK TO CONCRETE BEAM DETAIL

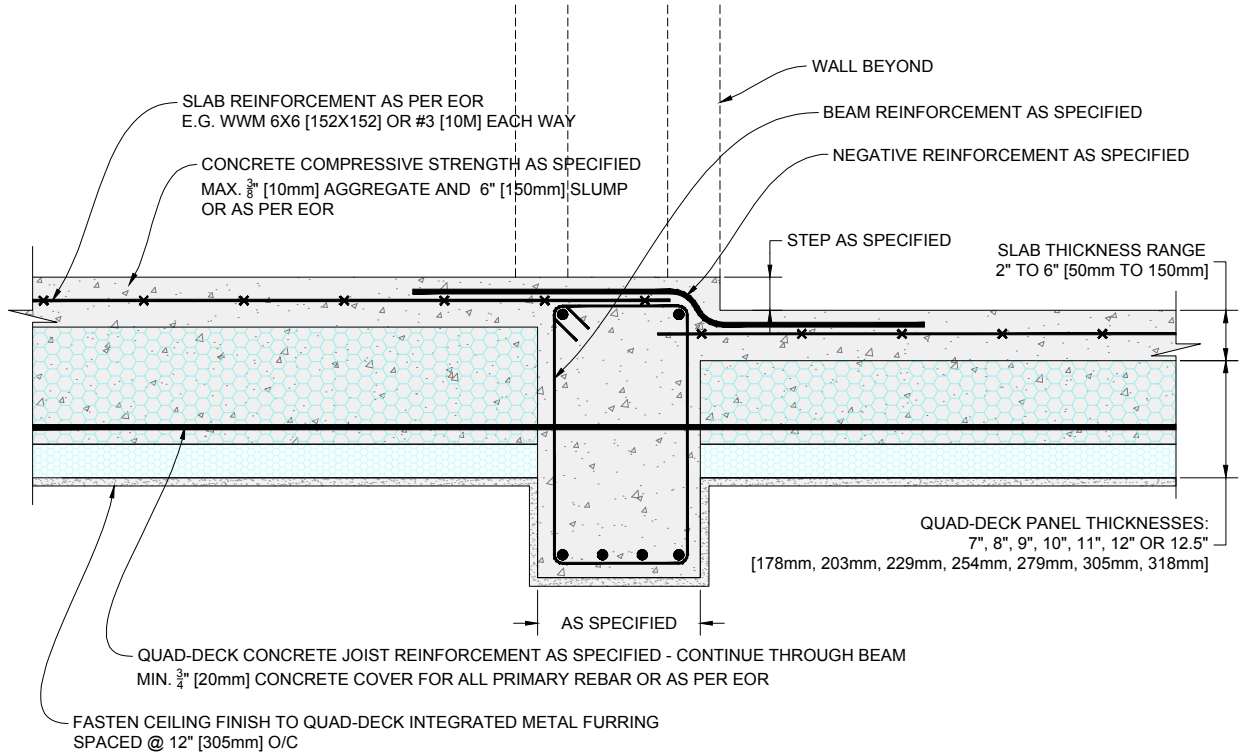
DATE DRAWN:	2015-05-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-307



1 QUAD-DECK FLUSHED BEAM DETAIL WITH FLOOR STEP (Panels running perpendicular to beam)

Scale: N.T.S.



1 QUAD-DECK DROPPED BEAM DETAIL WITH FLOOR STEP (Panels running perpendicular to beam)

Scale: N.T.S.

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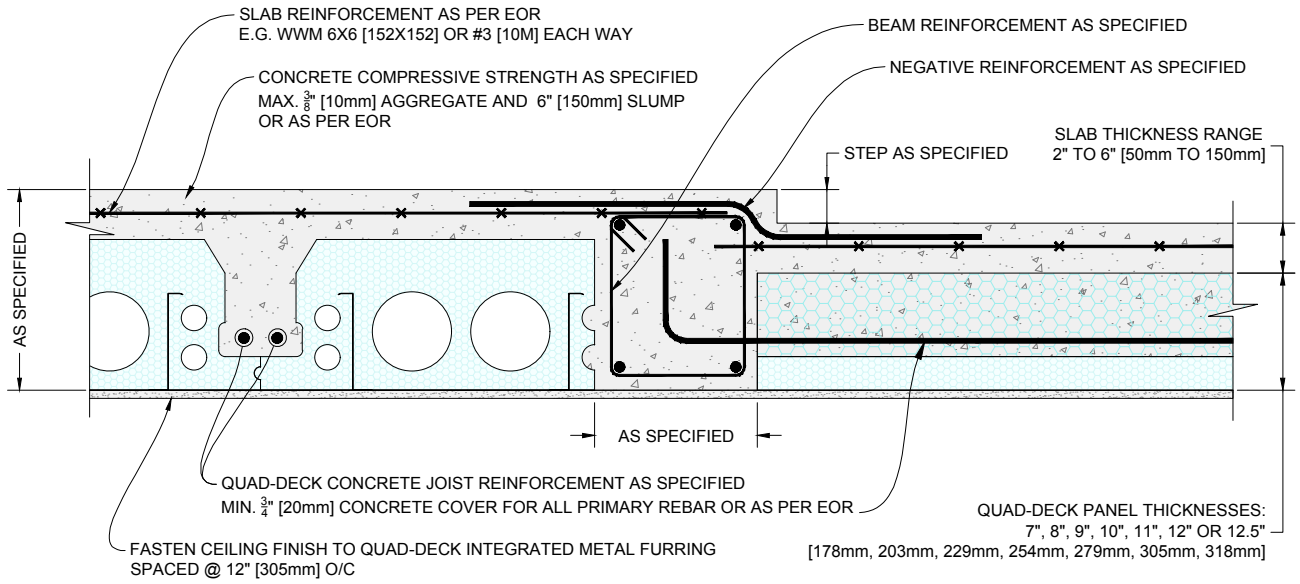
QUAD-DECK TO CONCRETE BEAM DETAIL

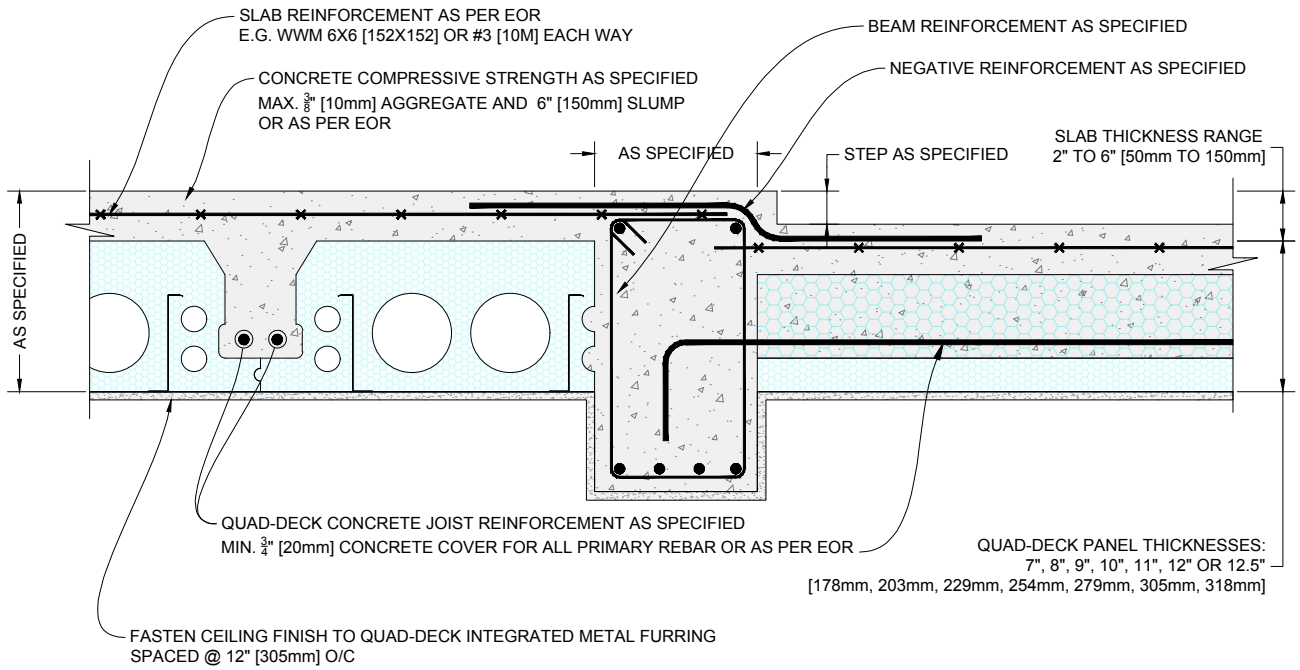
DATE DRAWN:	2015-05-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-308



1 QUAD-DECK FLUSHED BEAM DETAIL WITH FLOOR STEP (Panels running in both directions)

Scale: N.T.S.



1 QUAD-DECK DROPPED BEAM DETAIL WITH FLOOR STEP (Panels running in both directions)

Scale: N.T.S.

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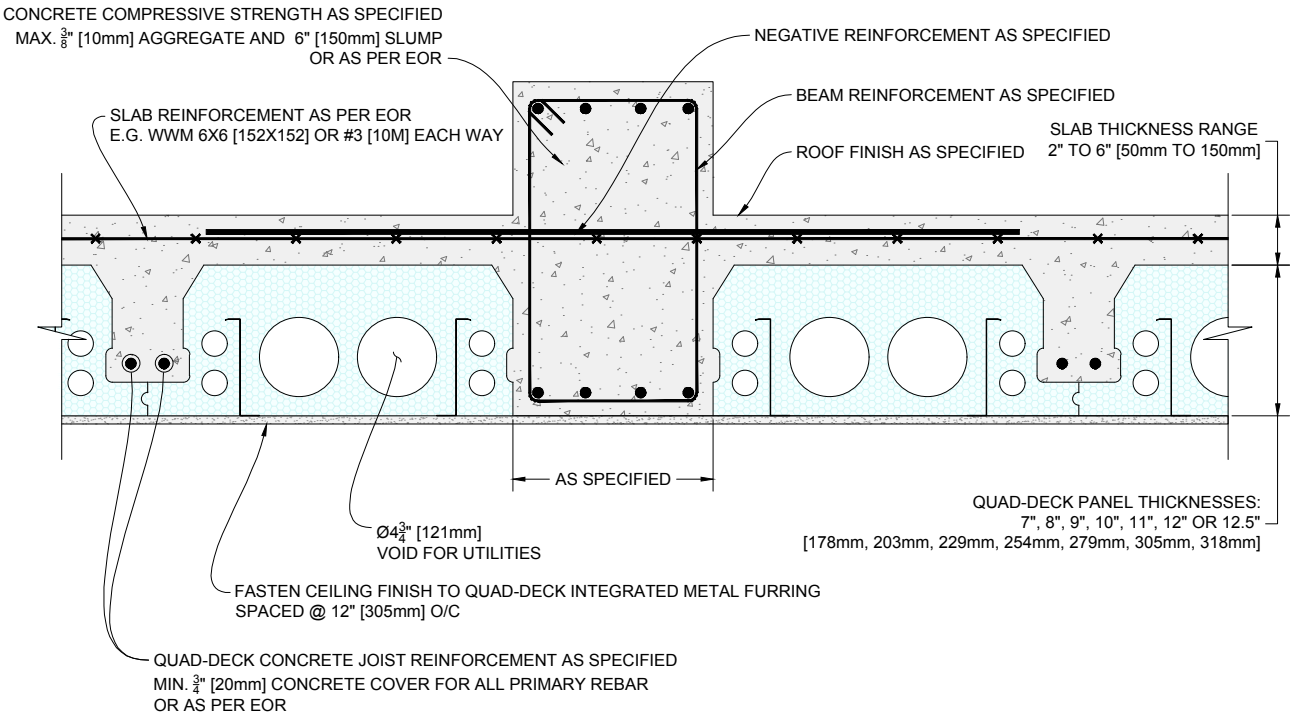
QUAD-DECK TO CONCRETE BEAM DETAIL

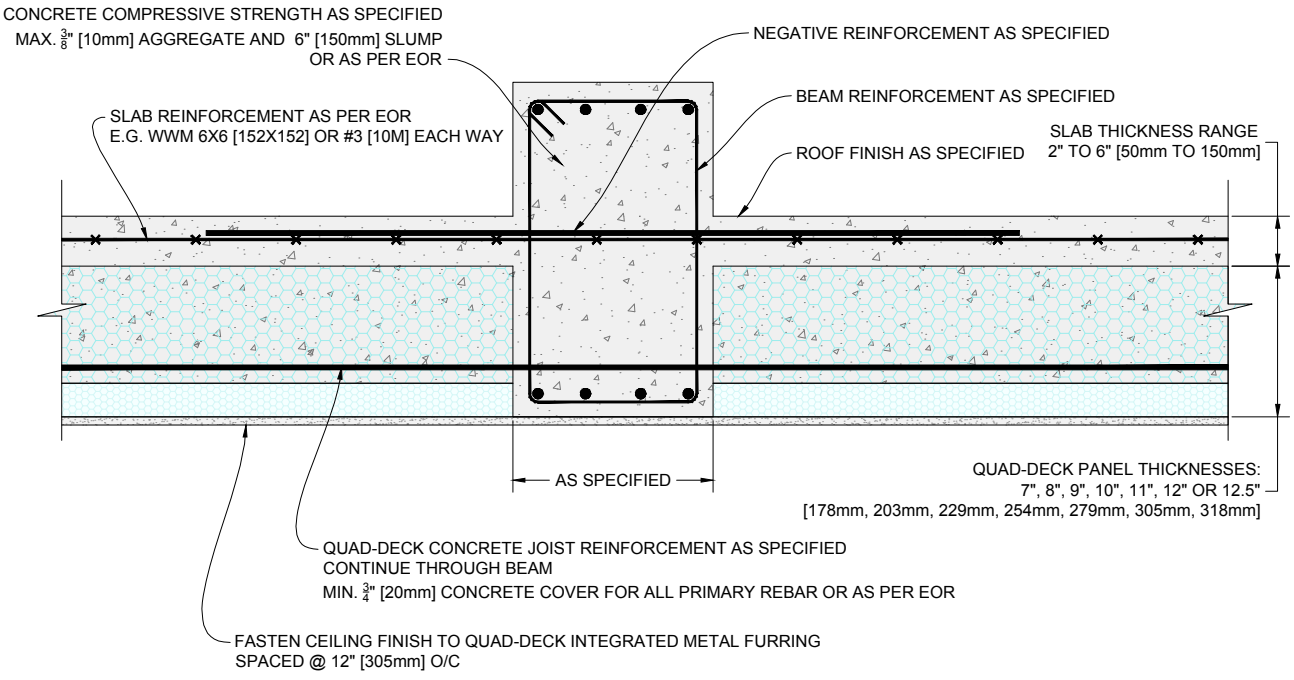
DATE DRAWN:	2015-05-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-309



1 QUAD-DECK UPSTAND BEAM DETAIL (Panels Parallel to Beam)

Scale: N.T.S.



2 QUAD-DECK UPSTAND BEAM DETAIL (Panels Perpendicular to Beam)

Scale: N.T.S.

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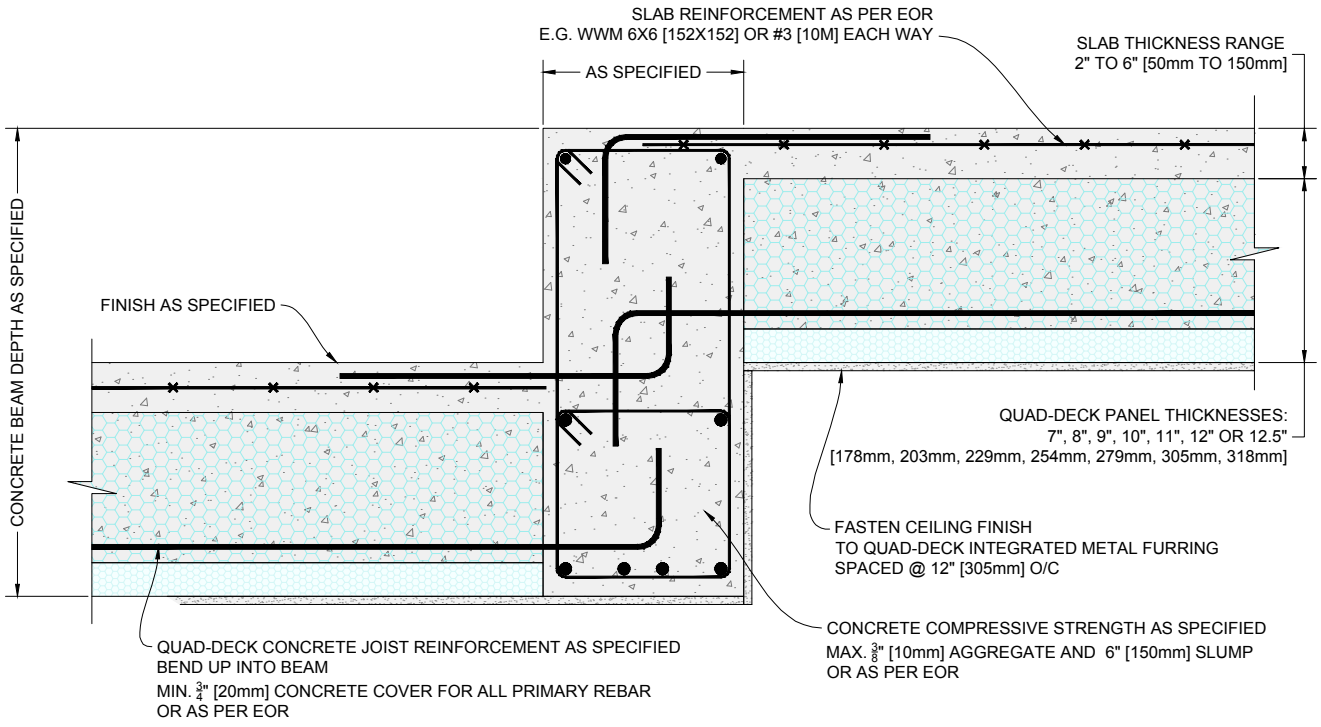
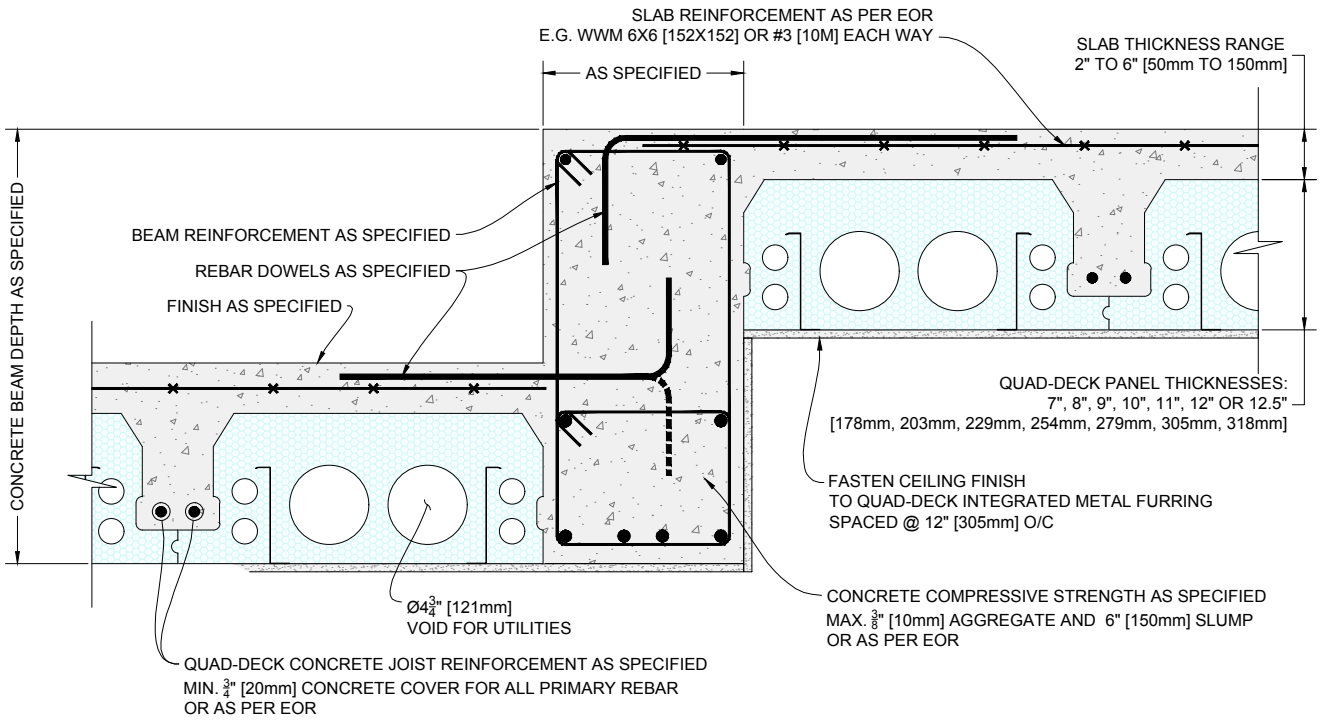
QUAD-DECK UPSTAND BEAM DETAIL

DATE DRAWN: 2015-05-15		COMMENTS: N/A	
REVISION NO: YYYY-MM-DD		SHEET SIZE: 8.5" x 11" [216mm x 279mm]	
REVISION DATE: N/A		SCALE: NOT TO SCALE	DRAWING NO: QD-310
DRAWN BY: Z. PROSTRAN		APPROVED BY: G. KUSTERMANN	



1 QUAD-DECK STEP DETAIL DETAIL (Panels Perpendicular to Beam)

Scale: N.T.S.



2 QUAD-DECK STEP DETAIL DETAIL (Panels Parallel to Beam)

Scale: N.T.S.

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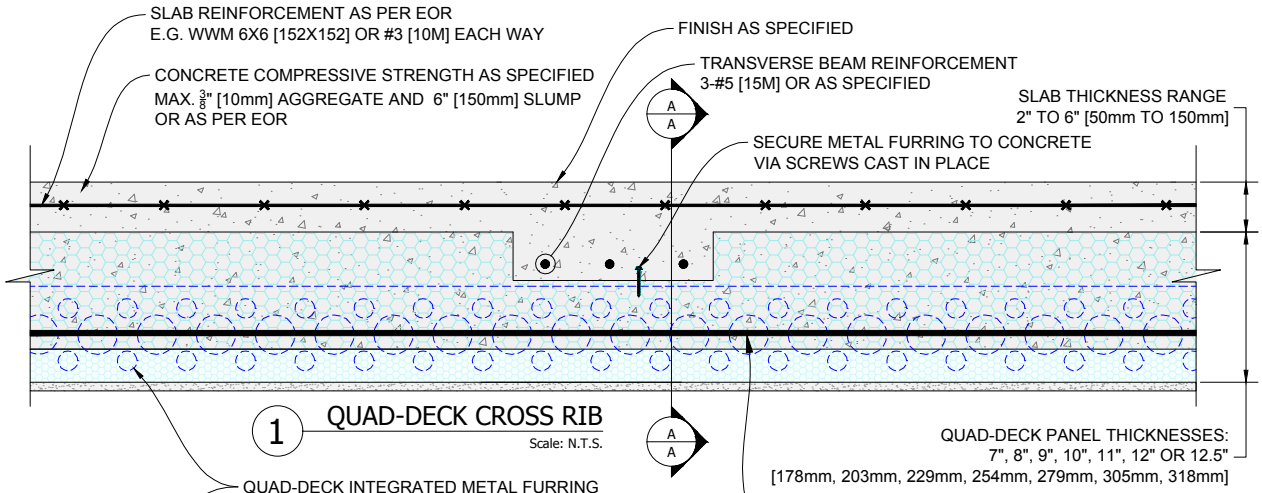
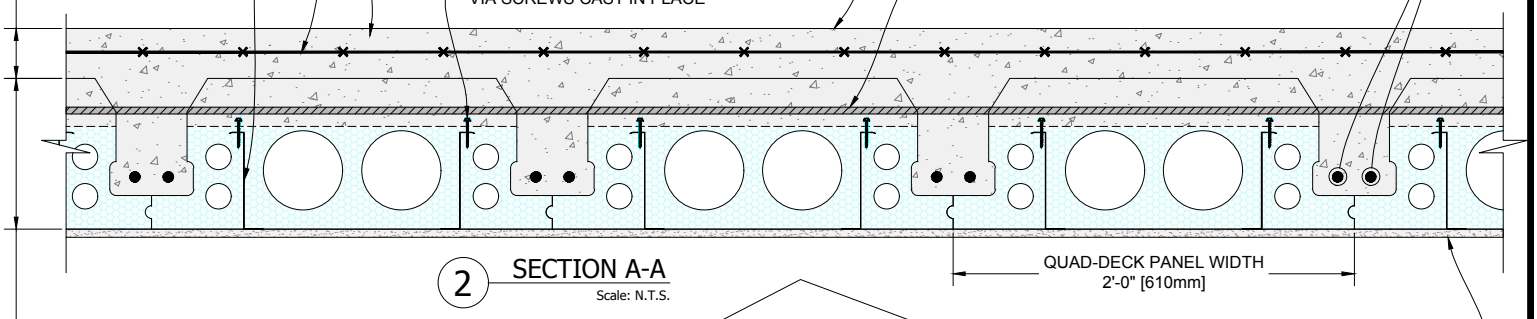
QUAD-DECK FLOOR ELEVATION CHANGE

DATE DRAWN: 2015-05-15		COMMENTS: N/A	
REVISION NO: YYYY-MM-DD		SHEET SIZE: 8.5" x 11" [216mm x 279mm]	
REVISION DATE: N/A		SCALE: NOT TO SCALE	DRAWING NO: QD-311
DRAWN BY: Z. PROSTRAN		APPROVED BY: G. KUSTERMANN	



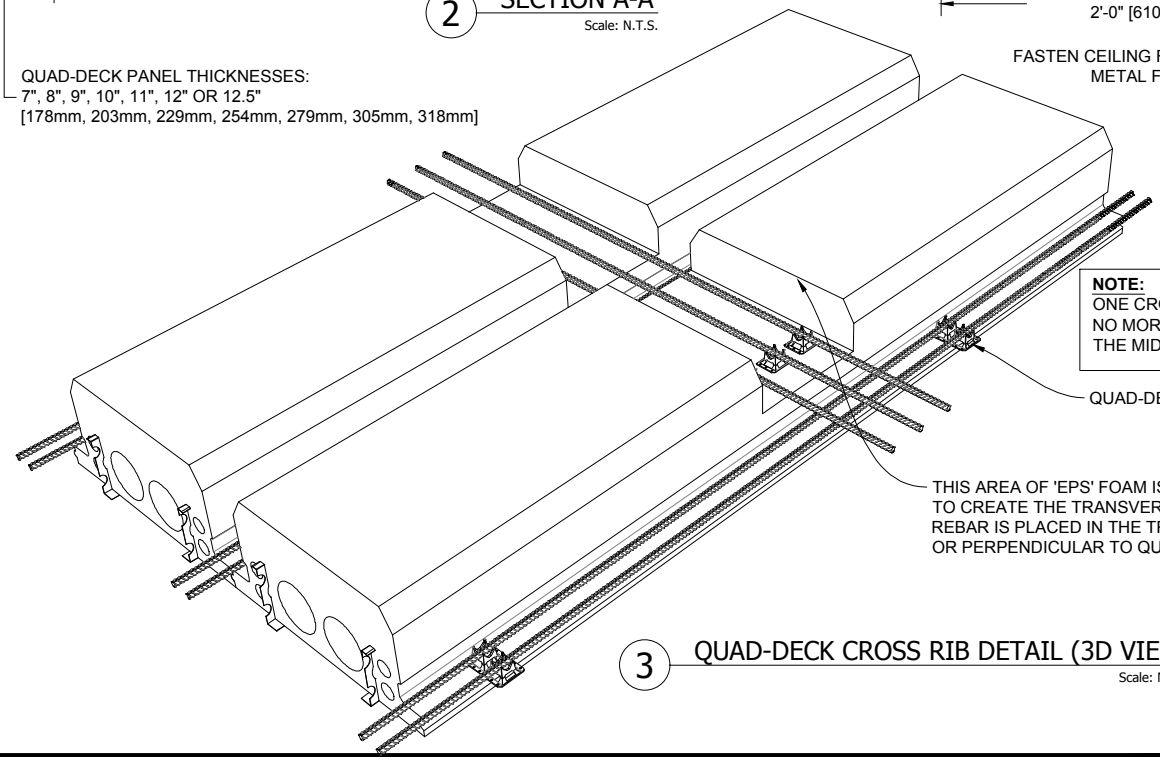
1 QUAD-DECK CROSS RIB

Scale: N.T.S.



2 SECTION A-A

Scale: N.T.S.



NOTE:
ONE CROSS RIBS MUST BE PRESENT AFTER NO MORE THAN 16' [4.9m] OF CLEAR SPAN IN THE MIDDLE OF THE PANEL

3 QUAD-DECK CROSS RIB DETAIL (3D VIEW)

Scale: N.T.S.

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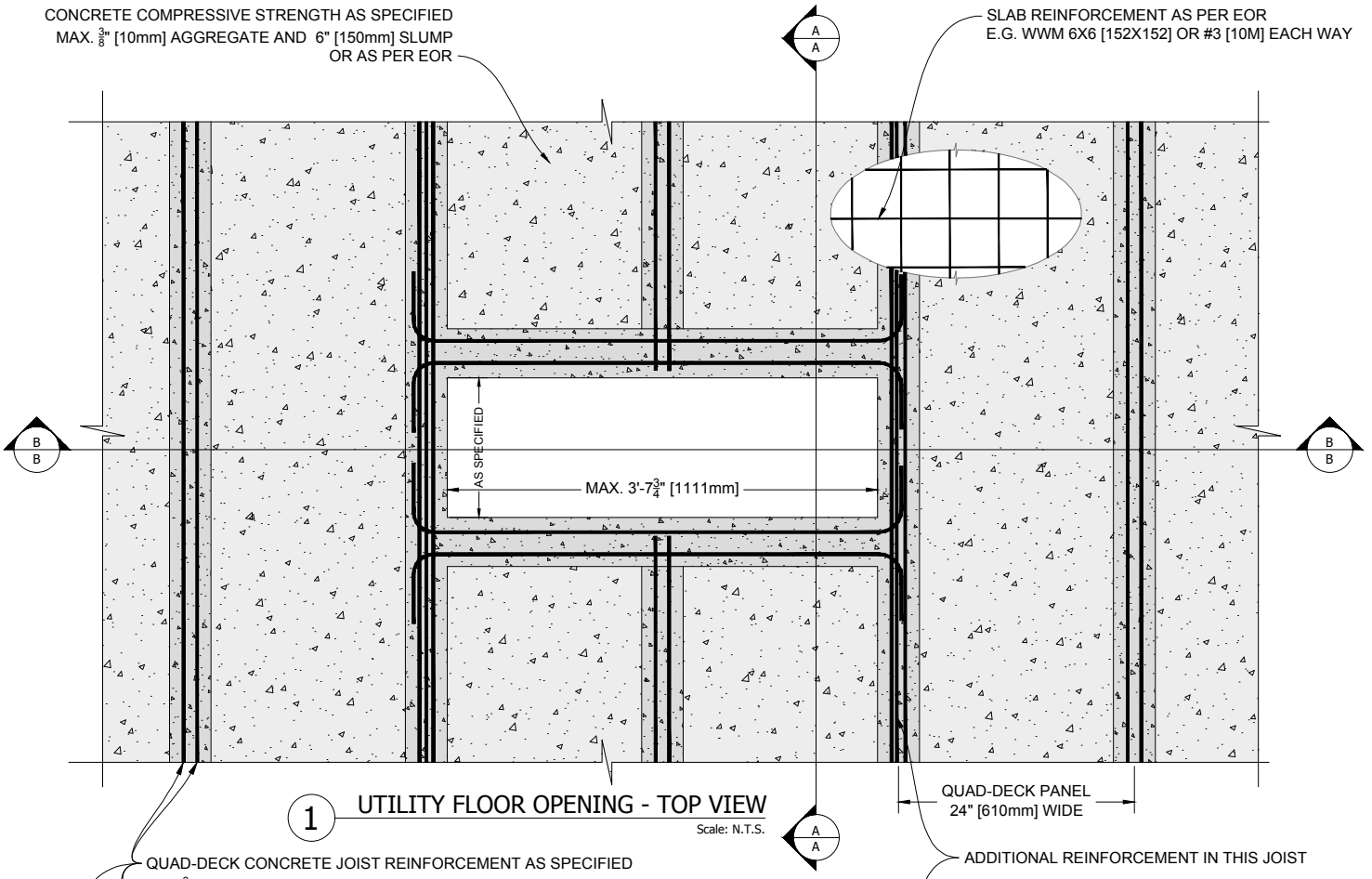
QUAD-DECK CROSS RIB DETAIL

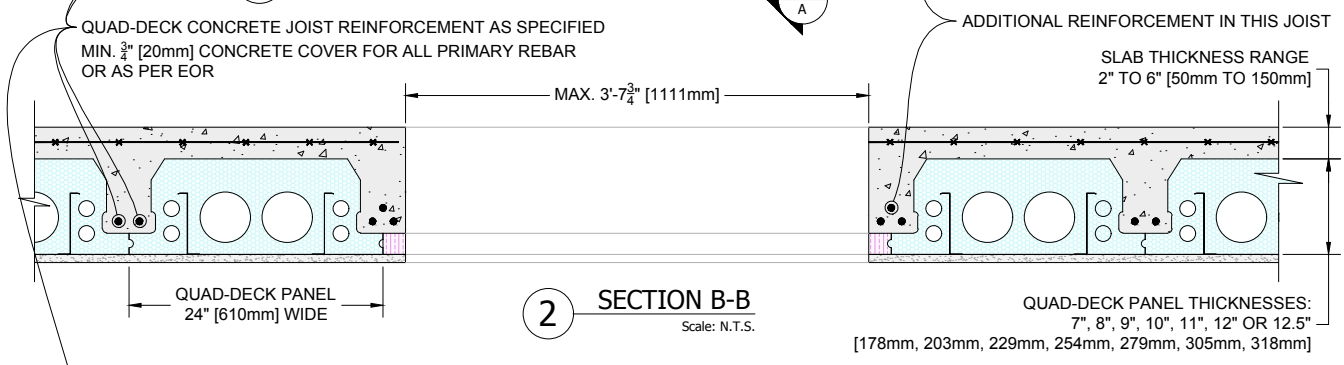
DATE DRAWN:	2015-05-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-312



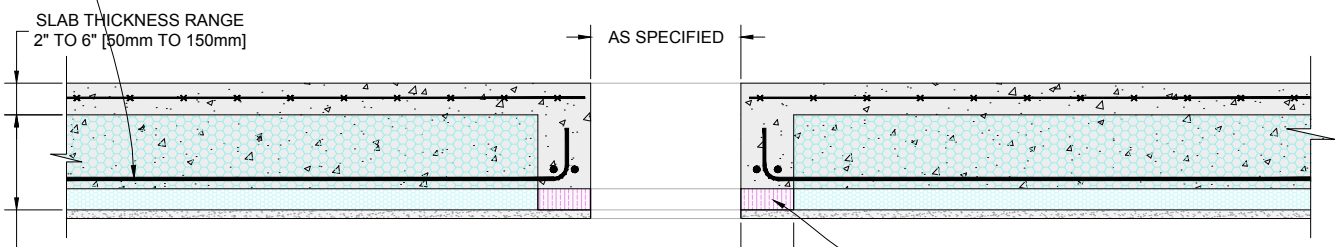
1 UTILITY FLOOR OPENING - TOP VIEW

Scale: N.T.S.



2 SECTION B-B

Scale: N.T.S.



2 SECTION A-A

Scale: N.T.S.

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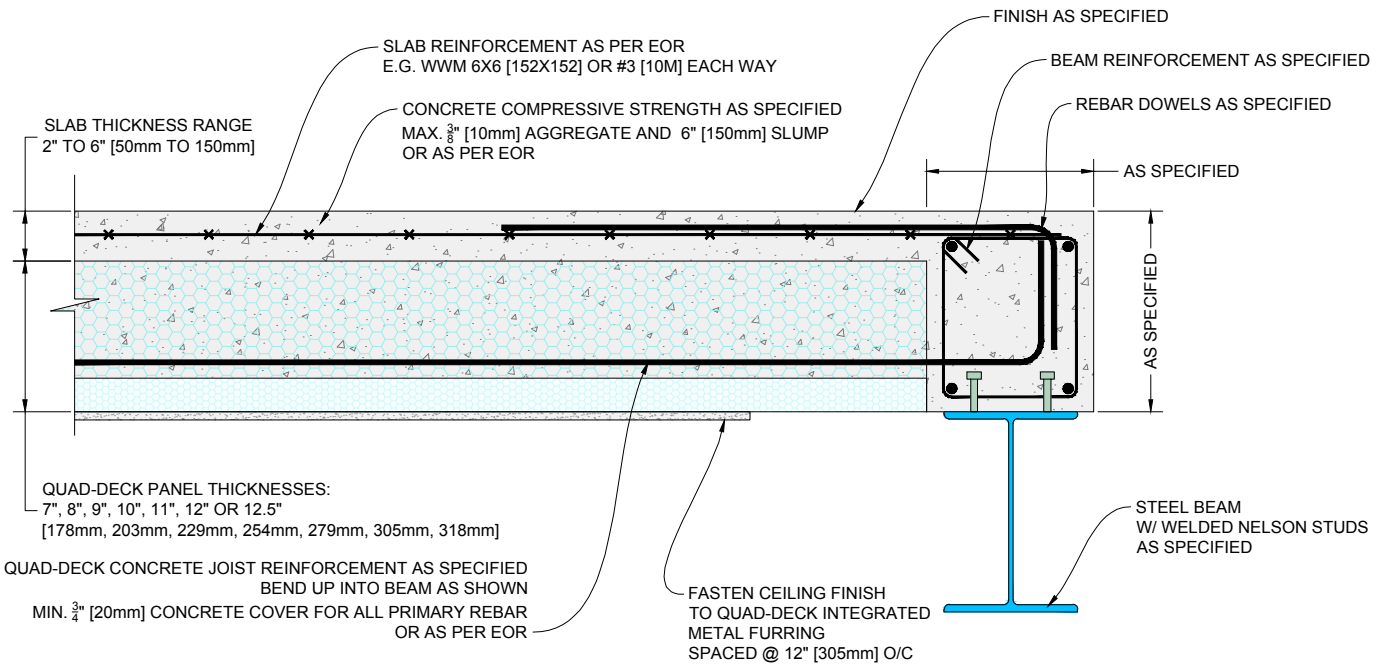
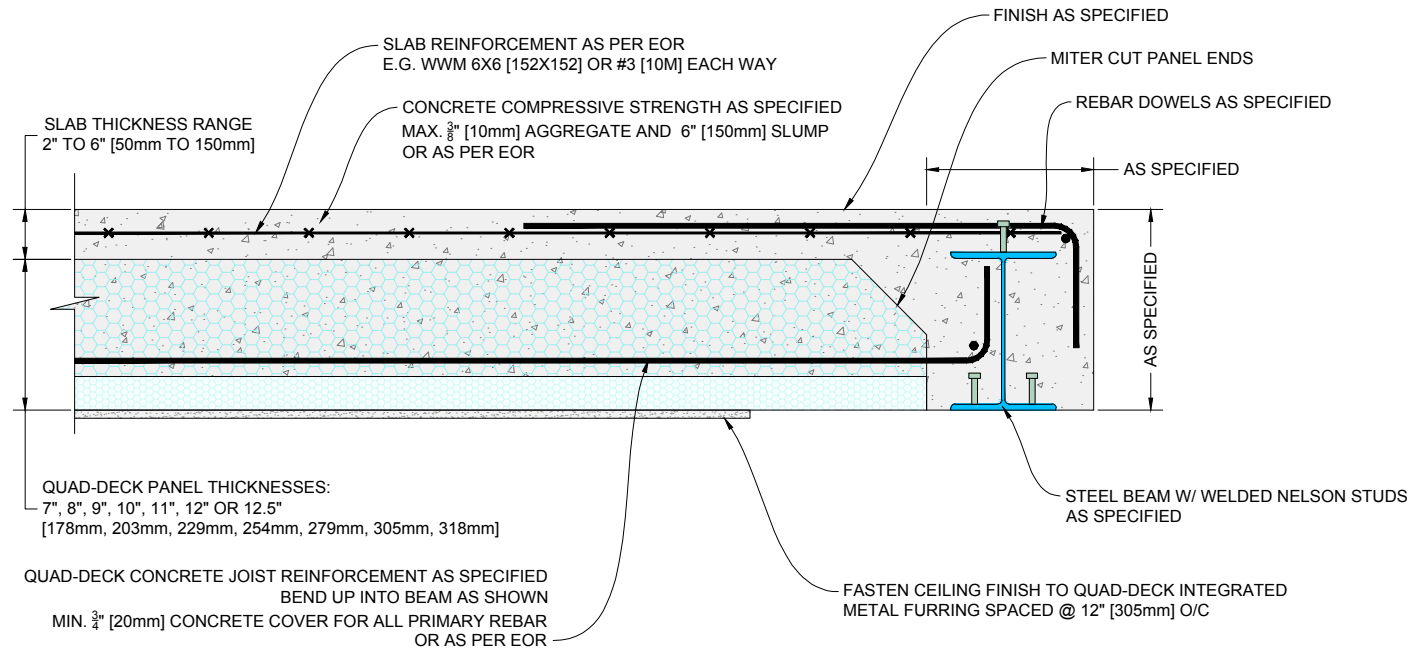
QUAD-DECK UTILITY OPENING DETAIL

DATE DRAWN:	2015-05-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN
		DRAWING NO:	QD-313



1 QUAD-DECK TO DROPPED PERIMETER STEEL BEAM DETAIL (Panels Perpendicular to Beam)

Scale: N.T.S.



2 QUAD-DECK TO FLUSHED PERIMETER STEEL BEAM DETAIL (Panels Perpendicular to Beam)

Scale: N.T.S.

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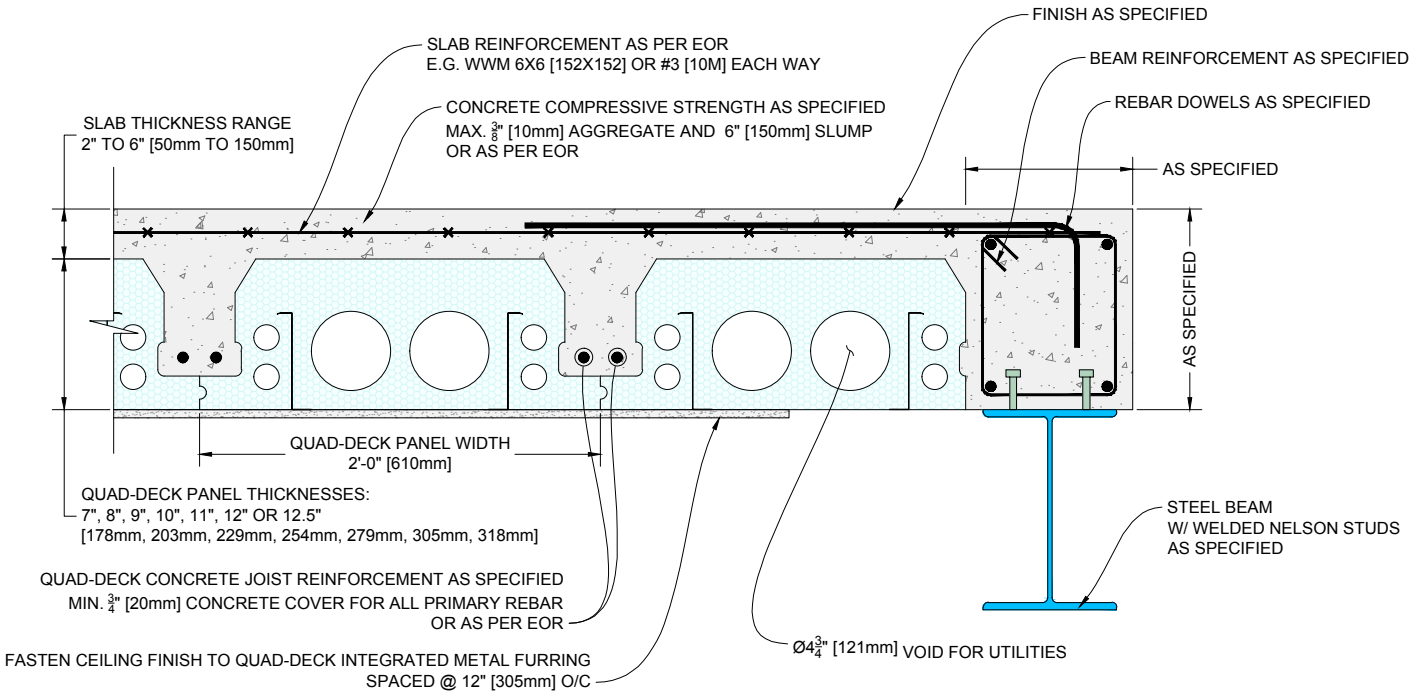
QUAD-DECK TO STEEL BEAM DETAIL

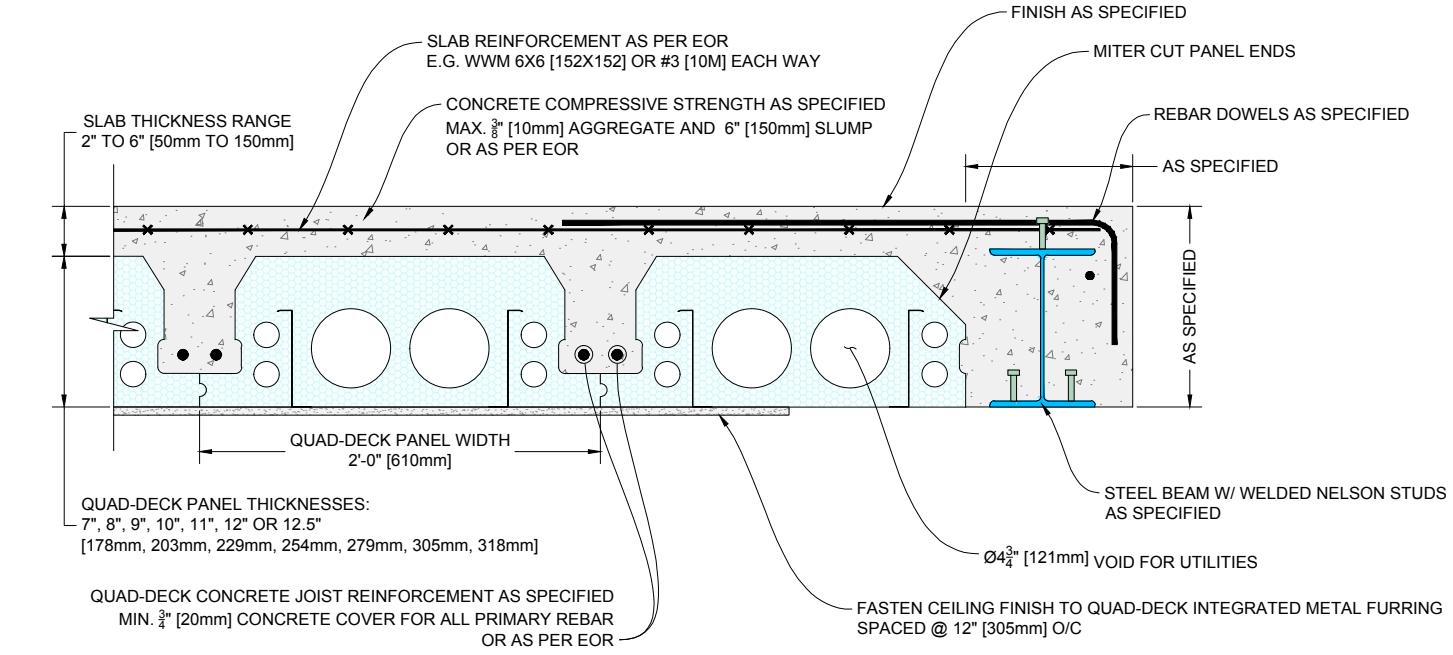
DATE DRAWN:	2015-05-25	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-401



1 QUAD-DECK TO DROPPED PERIMETER STEEL BEAM DETAIL (Panels Parallel to Beam)

Scale: N.T.S.



1 QUAD-DECK TO FLUSHED PERIMETER STEEL BEAM DETAIL (Panels Parallel to Beam)

Scale: N.T.S.

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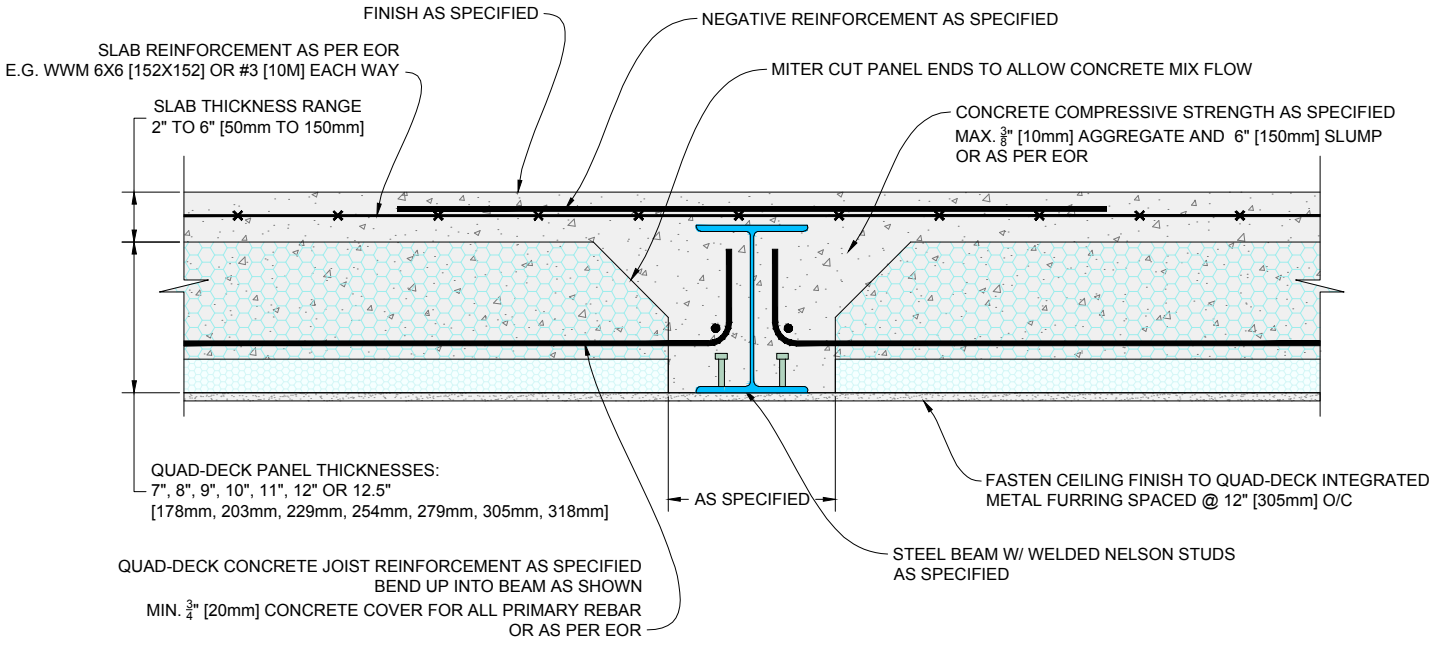
QUAD-DECK TO STEEL BEAM DETAIL

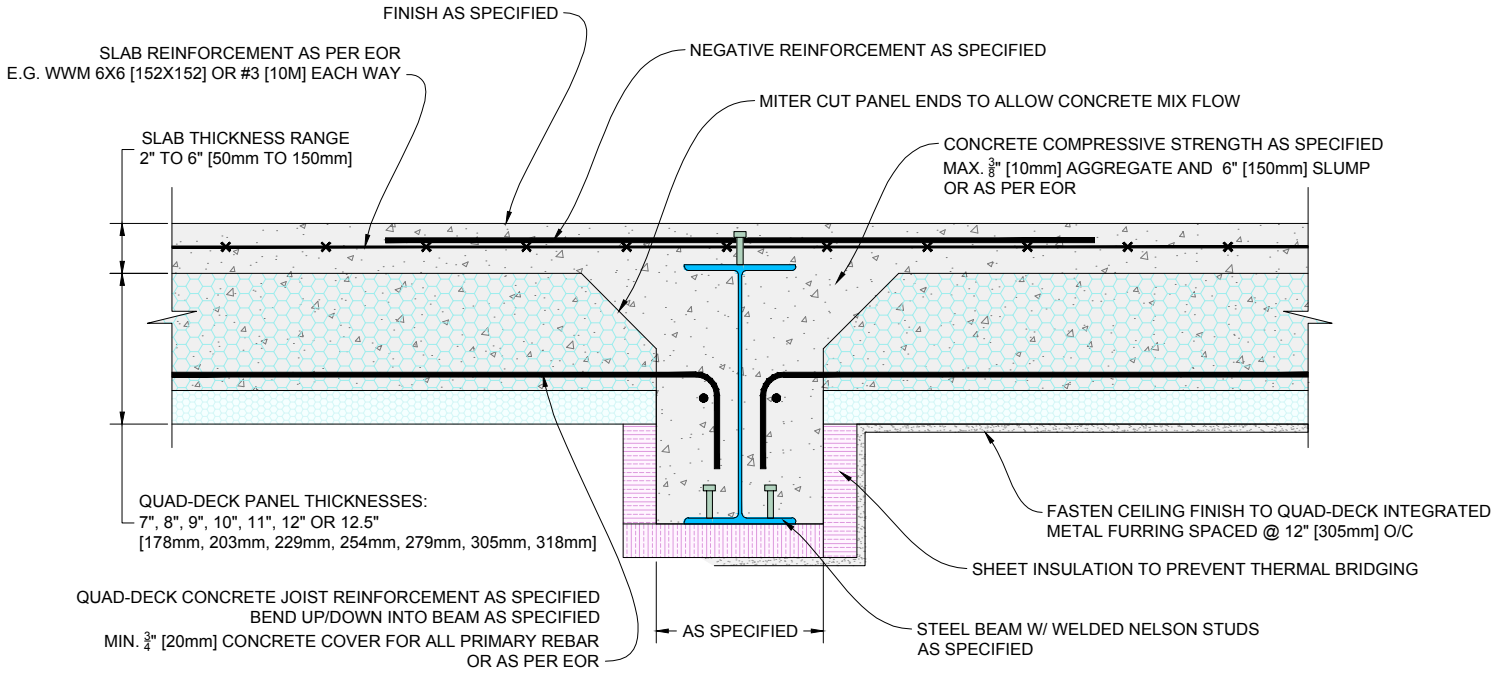
DATE DRAWN:	2015-05-25	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-402



2 QUAD-DECK TO FLUSHED STEEL BEAM DETAIL (Panels Perpendicular to Beam)

Scale: N.T.S.



2 QUAD-DECK TO DROPPED BEAM DETAIL (Panels Perpendicular to Beam)

Scale: N.T.S.

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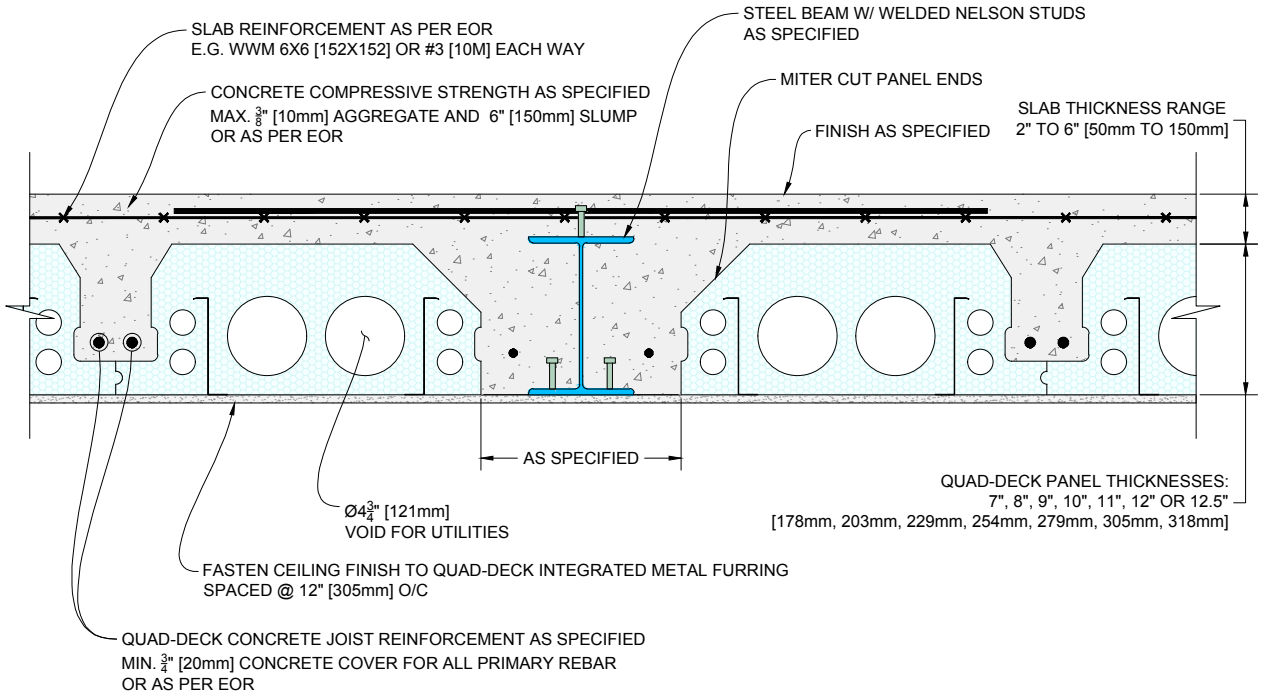
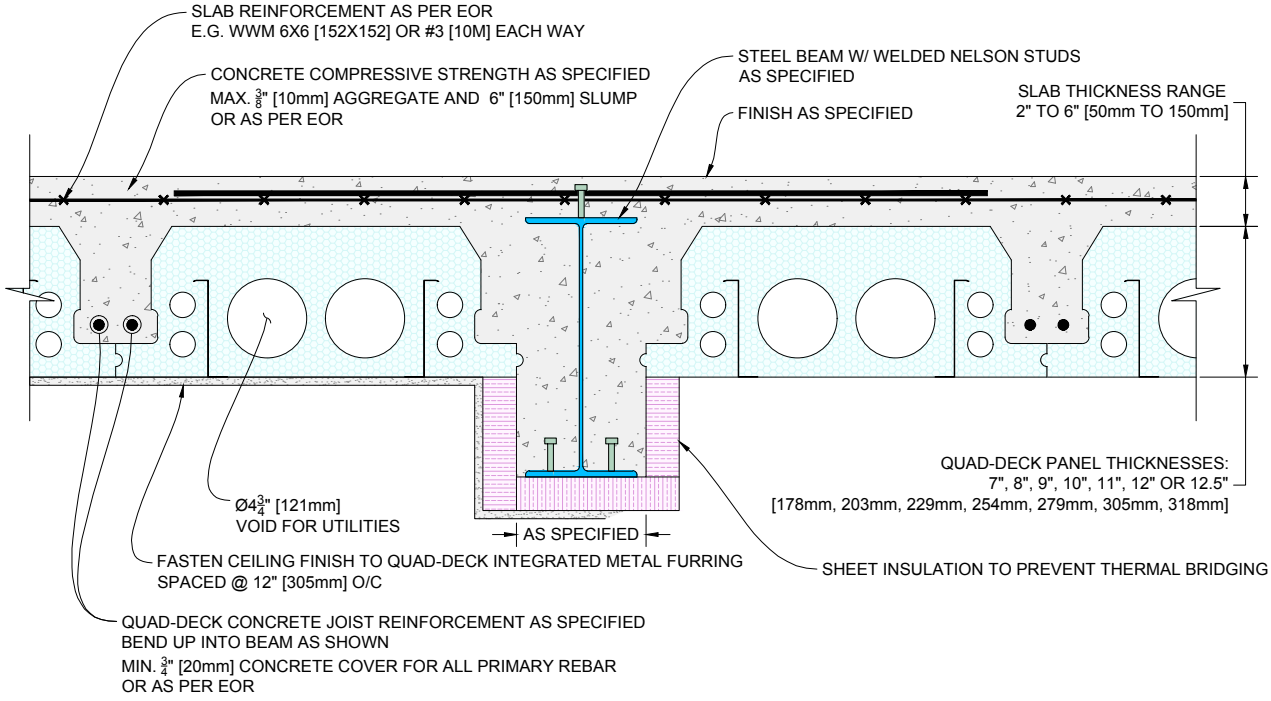
QUAD-DECK TO STEEL BEAM DETAIL

DATE DRAWN:	2015-05-25	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN
		DRAWING NO:	QD-403



1 QUAD-DECK TO FLUSHED STEEL BEAM DETAIL (Panels Parallel to Beam)

Scale: N.T.S.



1 QUAD-DECK TO DROPPED STEEL BEAM DETAIL (Panels Parallel to Beam)

Scale: N.T.S.

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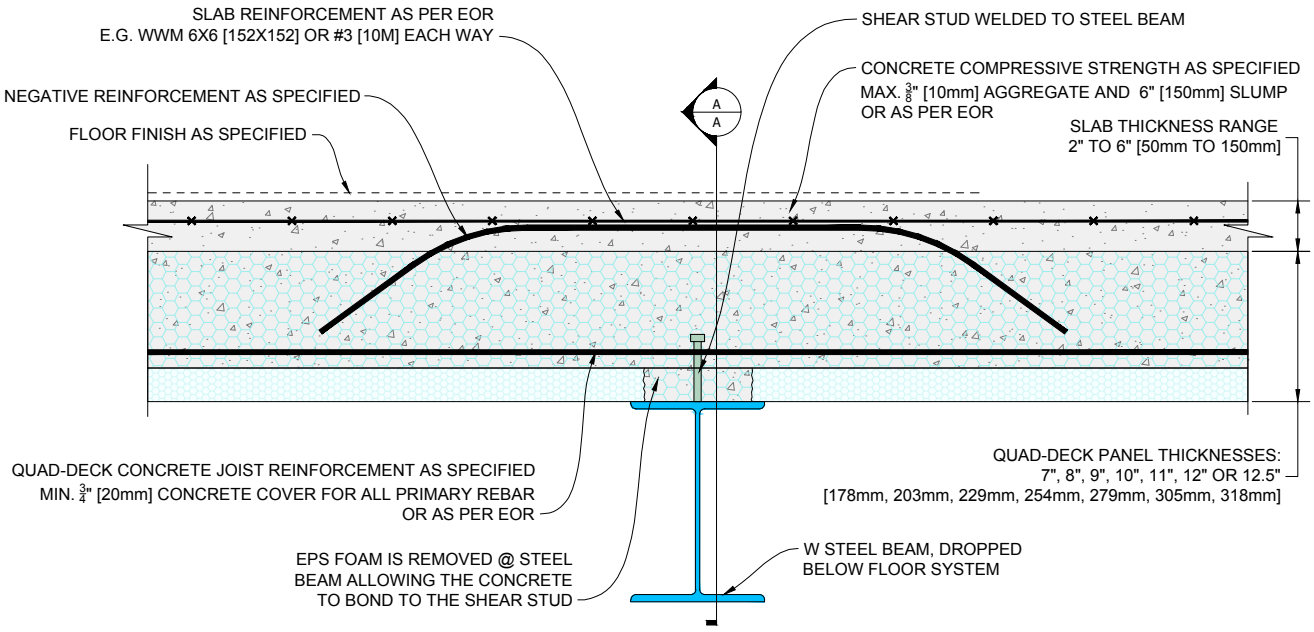
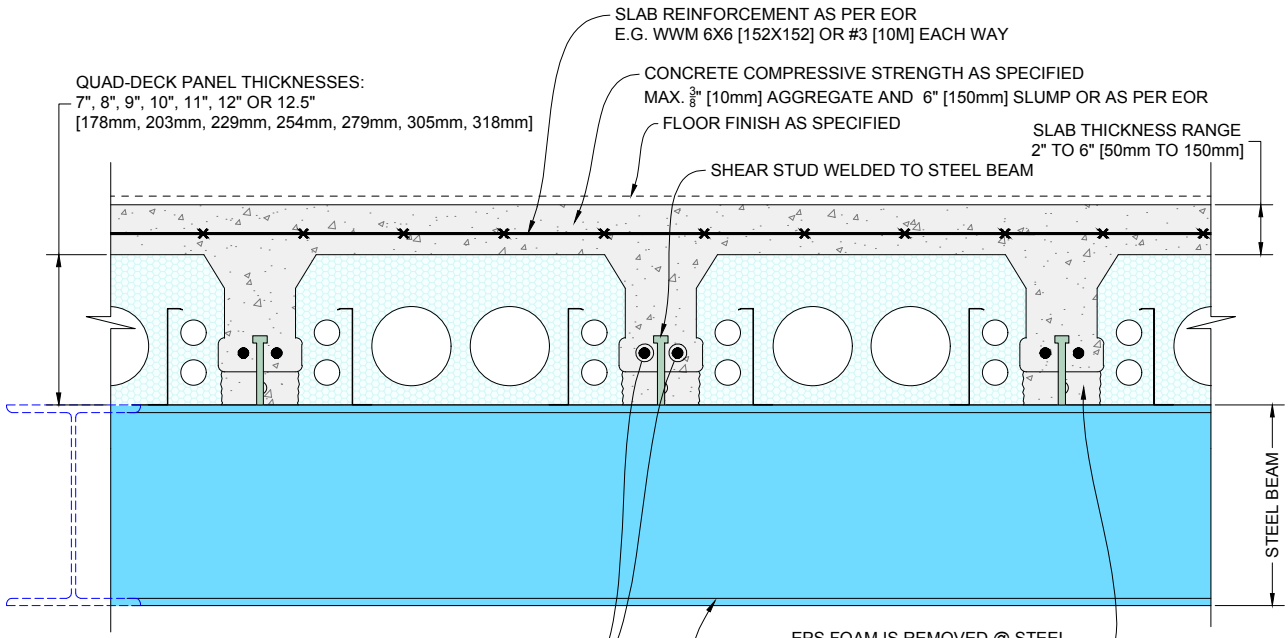
QUAD-DECK TO STEEL BEAM DETAIL

DATE DRAWN: 2015-05-25		COMMENTS: N/A	
REVISION NO: YYYY-MM-DD		SHEET SIZE: 8.5" x 11" [216mm x 279mm]	
REVISION DATE: N/A		SCALE: NOT TO SCALE	DRAWING NO: QD-404
DRAWN BY: Z. PROSTRAN		APPROVED BY: G. KUSTERMANN	



1 QUAD-DECK CONTINUOUS OVER STEEL BEAM (Panels Perpendicular to Beam)

Scale: N.T.S.



2 DETAIL A-A

Scale: N.T.S.

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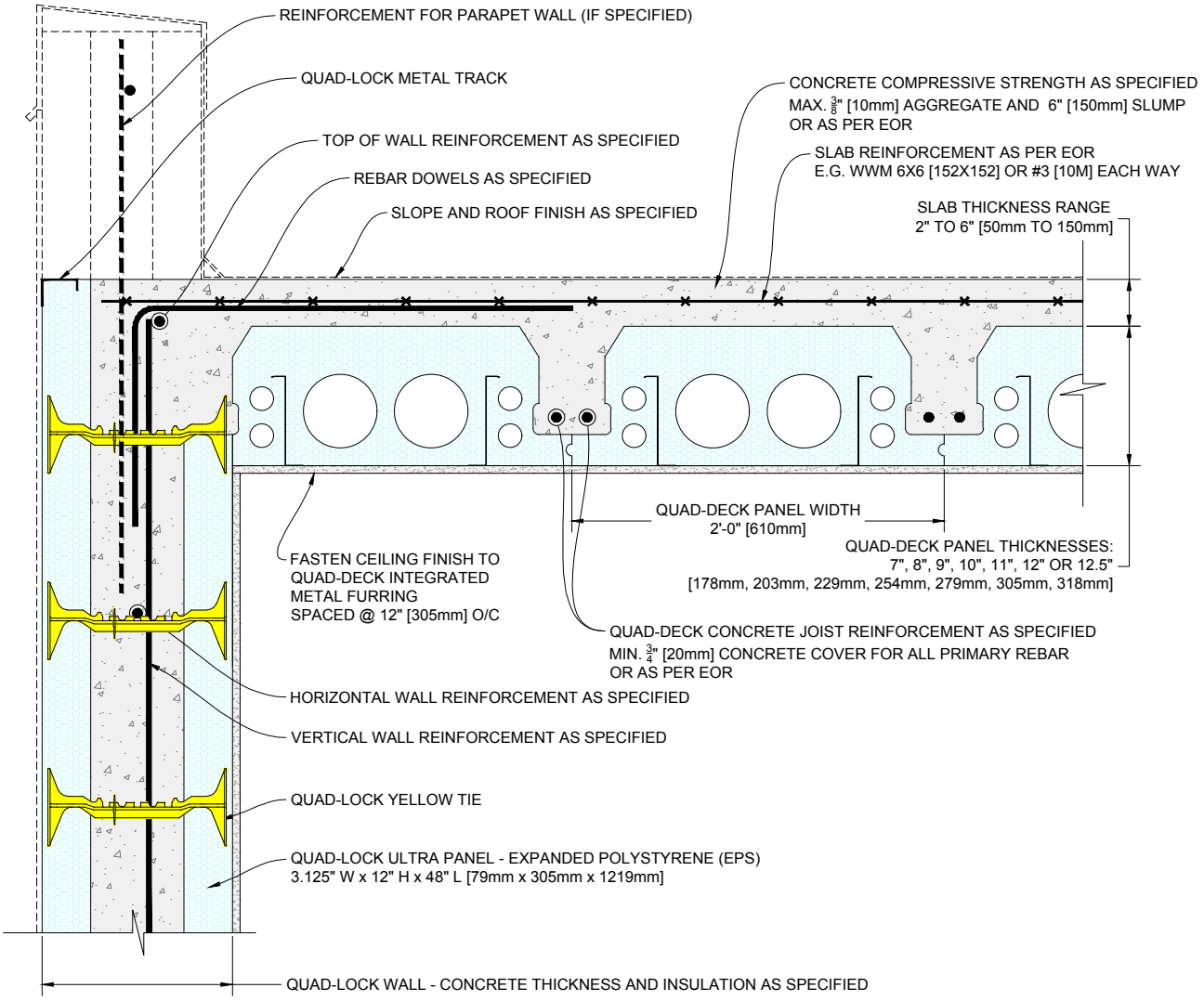
QUAD-DECK TO STEEL BEAM DETAIL

DATE DRAWN:	2015-05-25	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-405



1 QUAD-DECK PANELS PARALLEL TO TOP OF QUAD-LOCK WALL

Scale: N.T.S.

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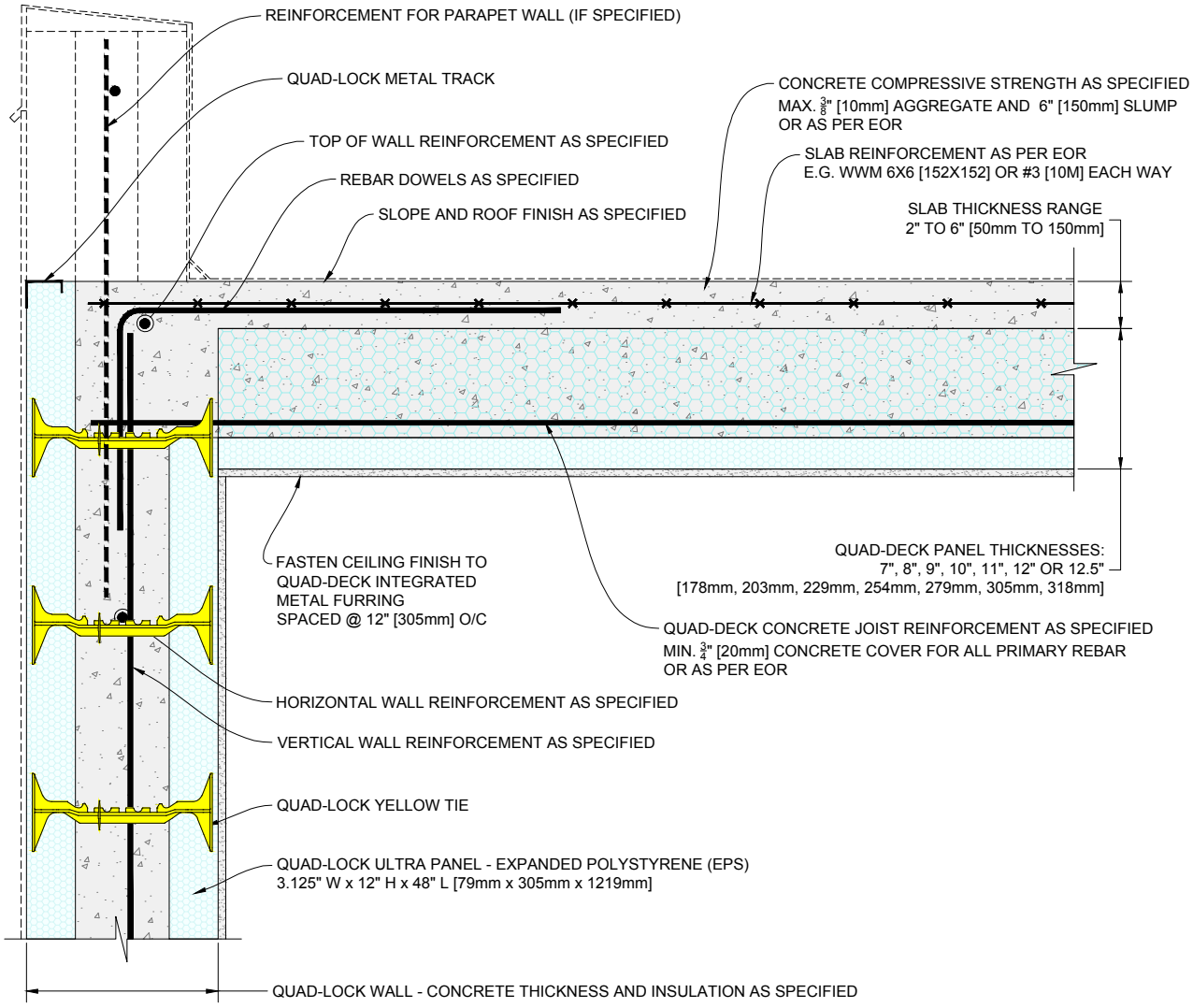
QUAD-DECK FLAT ROOF DETAIL

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-501



2 QUAD-DECK PANELS PERPENDICULAR TO TOP OF QUAD-LOCK WALL

Scale: N.T.S.

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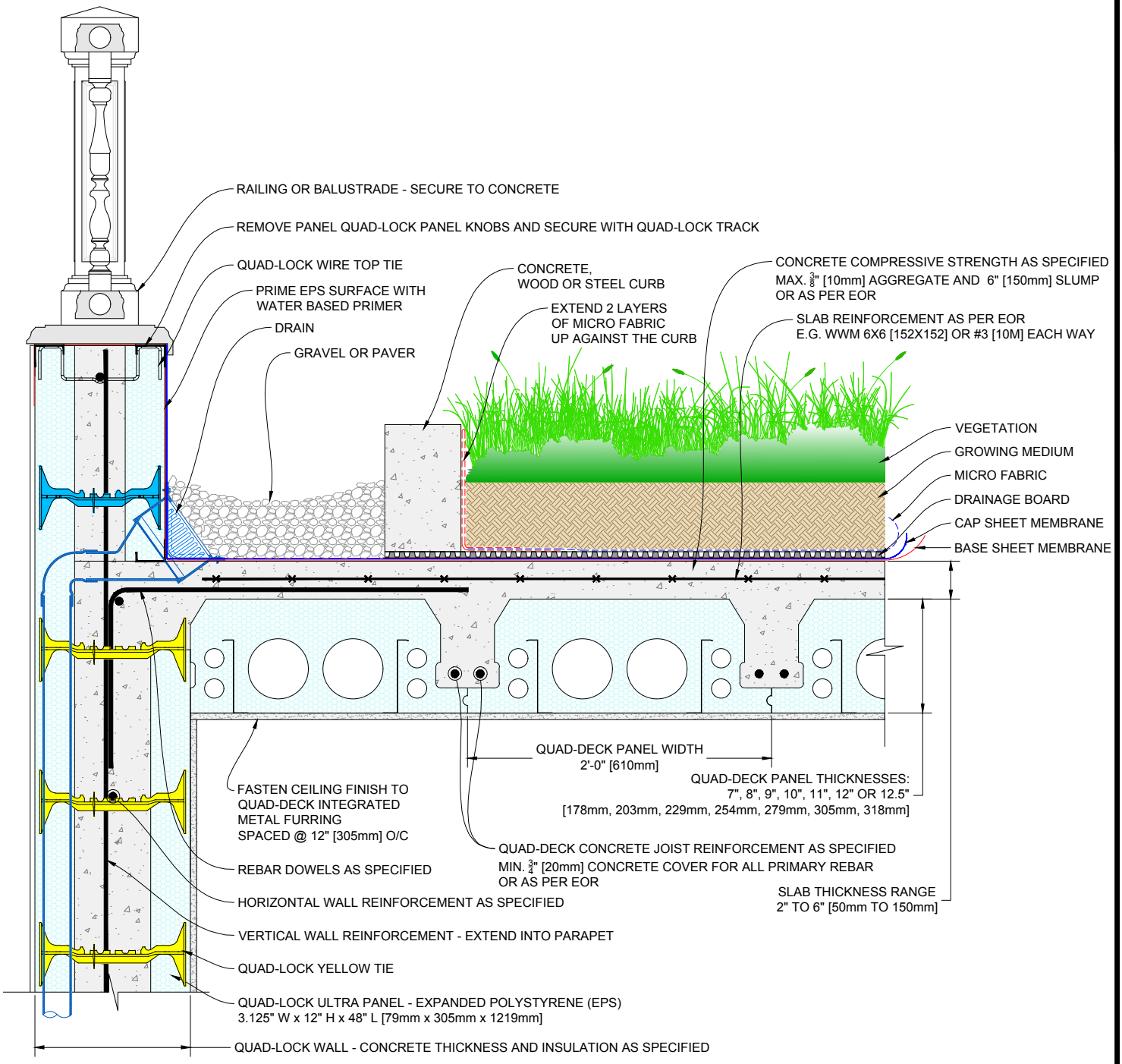
QUAD-DECK FLAT ROOF DETAIL

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-502



1 QUAD-DECK GREEN ROOF - PANELS PARALLEL TO TOP OF QUAD-LOCK WALL

Scale: N.T.S.

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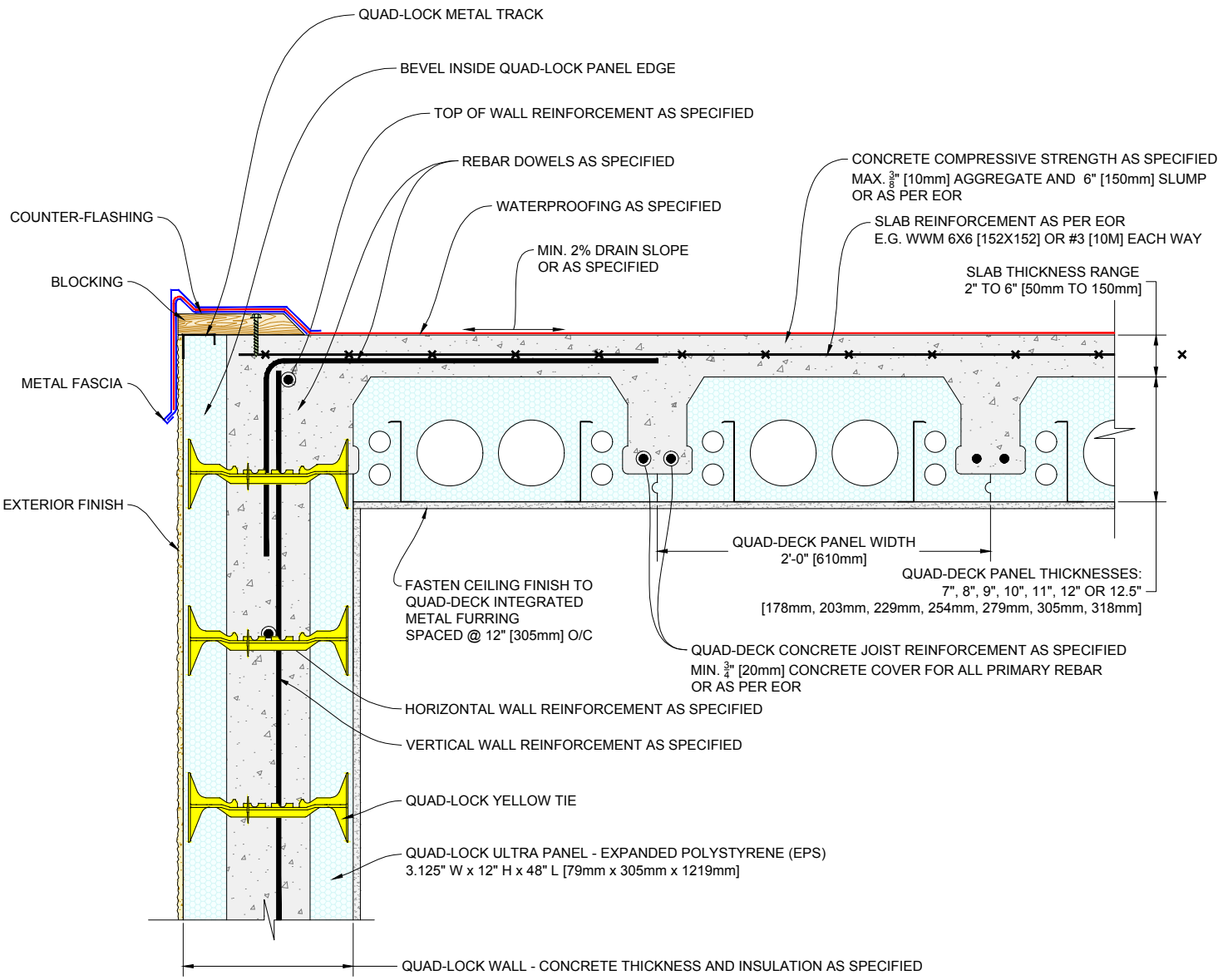
QUAD-DECK GREEN ROOF DETAIL

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-503



1 QUAD-DECK PANELS PARALLEL TO TOP OF QUAD-LOCK WALL

Scale: N.T.S.

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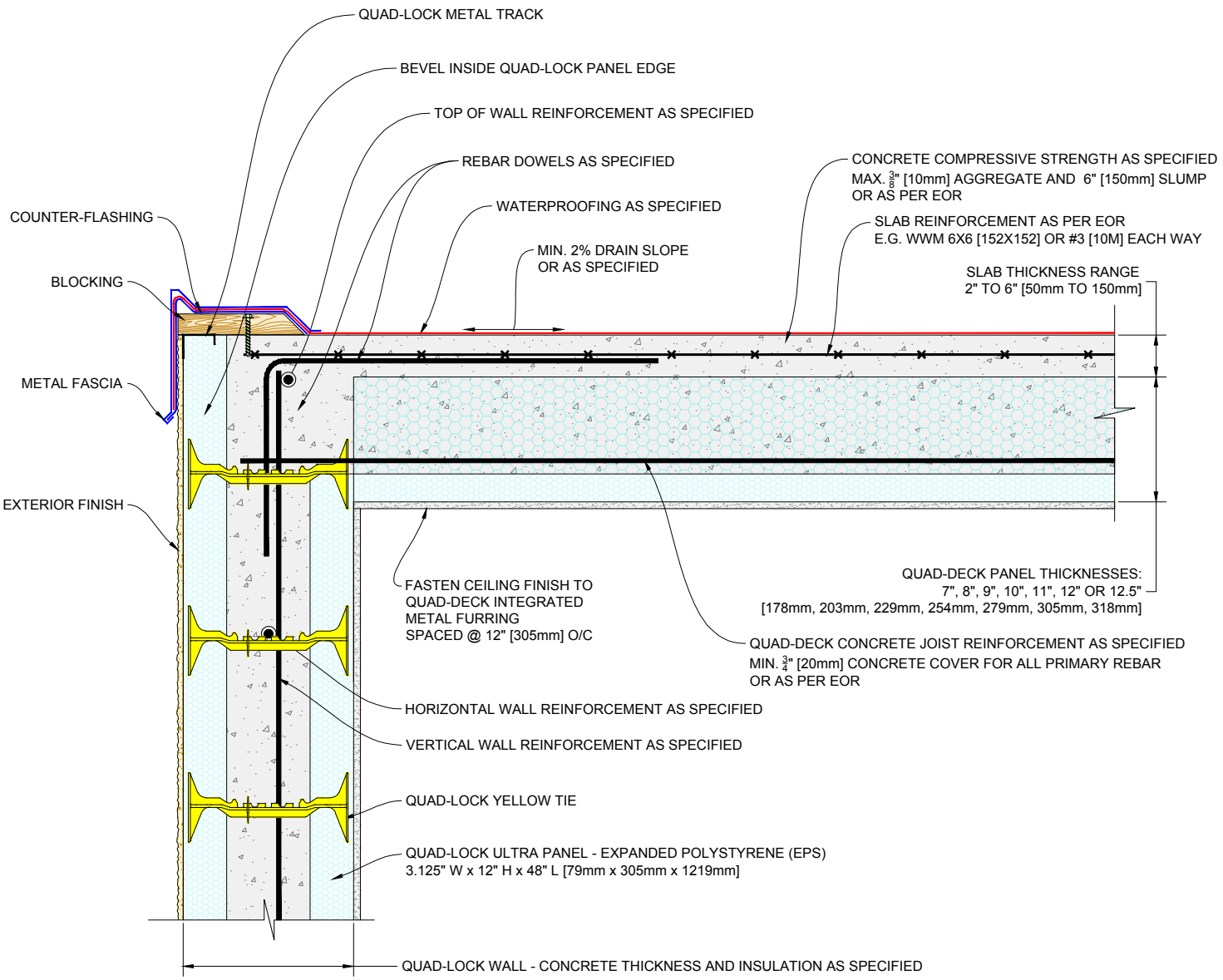
QUAD-DECK FLAT ROOF DETAIL

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-504



1 QUAD-DECK PANELS PERPENDICULAR TO TOP OF QUAD-LOCK WALL

Scale: N.T.S.

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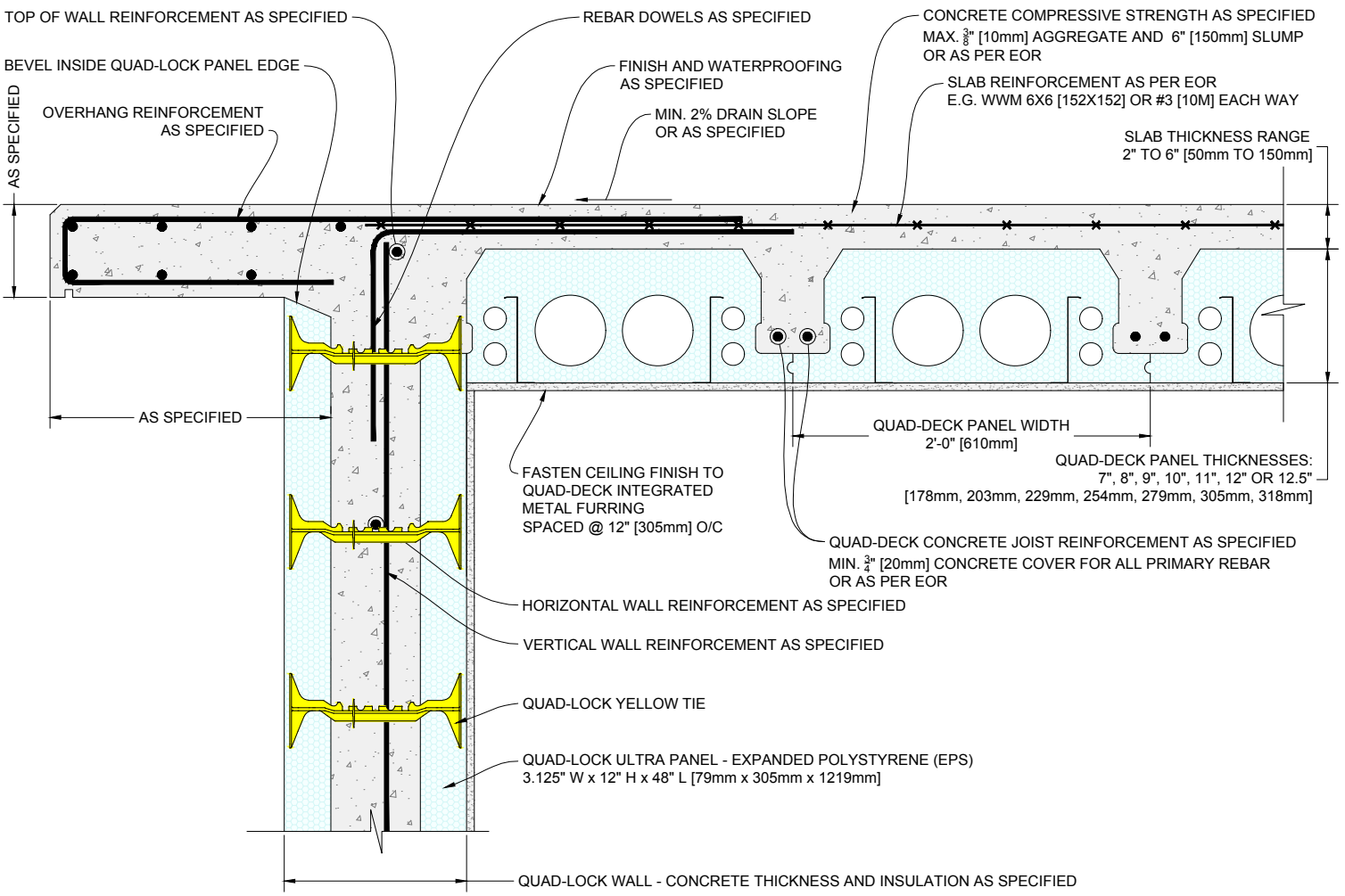
QUAD-DECK FLAT ROOF DETAIL

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-505



1 CONCRETE OVERHANG - QUAD-DECK PANELS PARALLEL TO QUAD-LOCK WALL

Scale: N.T.S.

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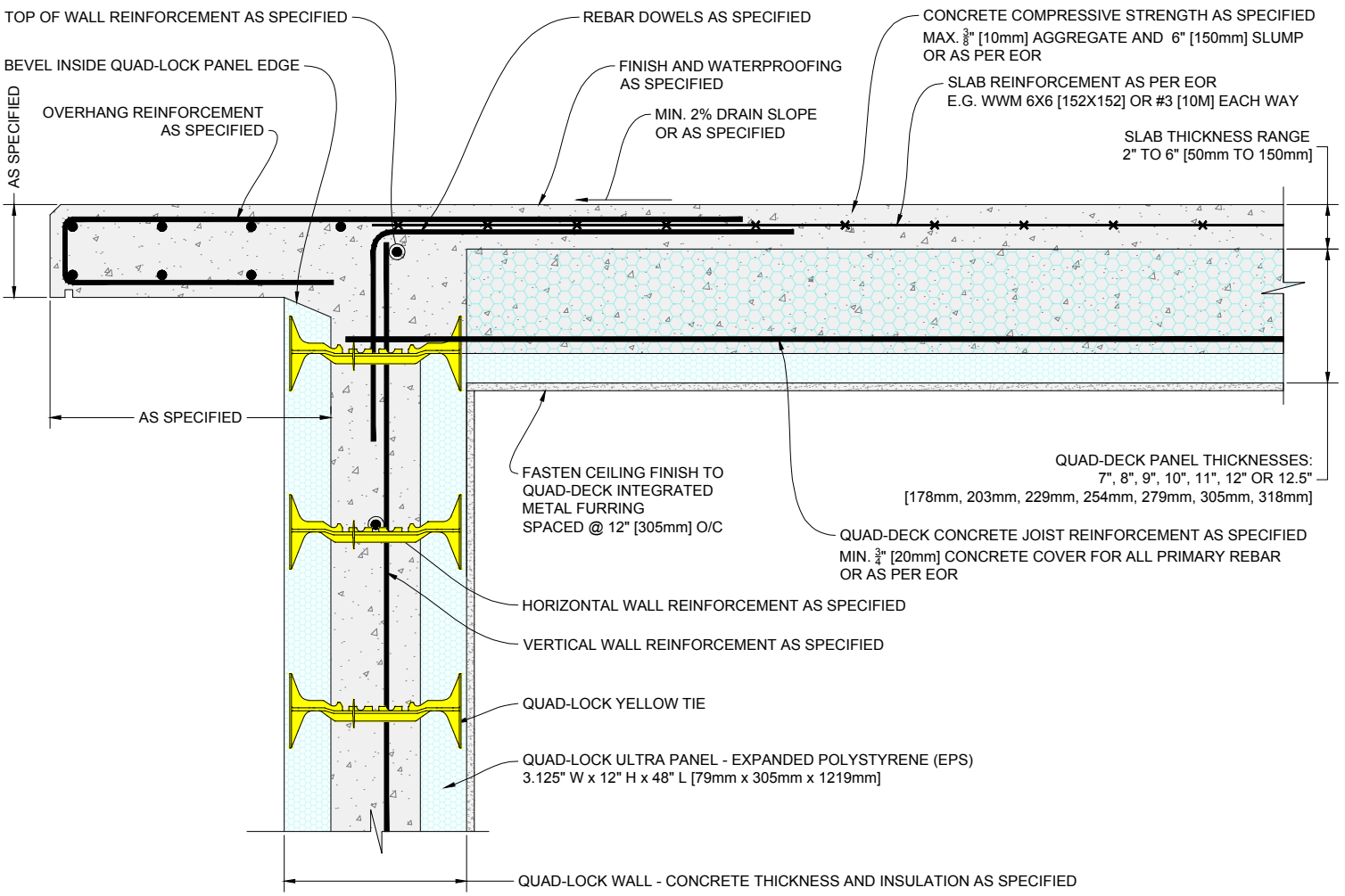
QUAD-DECK FLAT ROOF - CONCRETE OVERHANG

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-506



1 CONCRETE OVERHANG - QUAD-DECK PANELS PERPENDICULAR TO QUAD-LOCK WALL

Scale: N.T.S.

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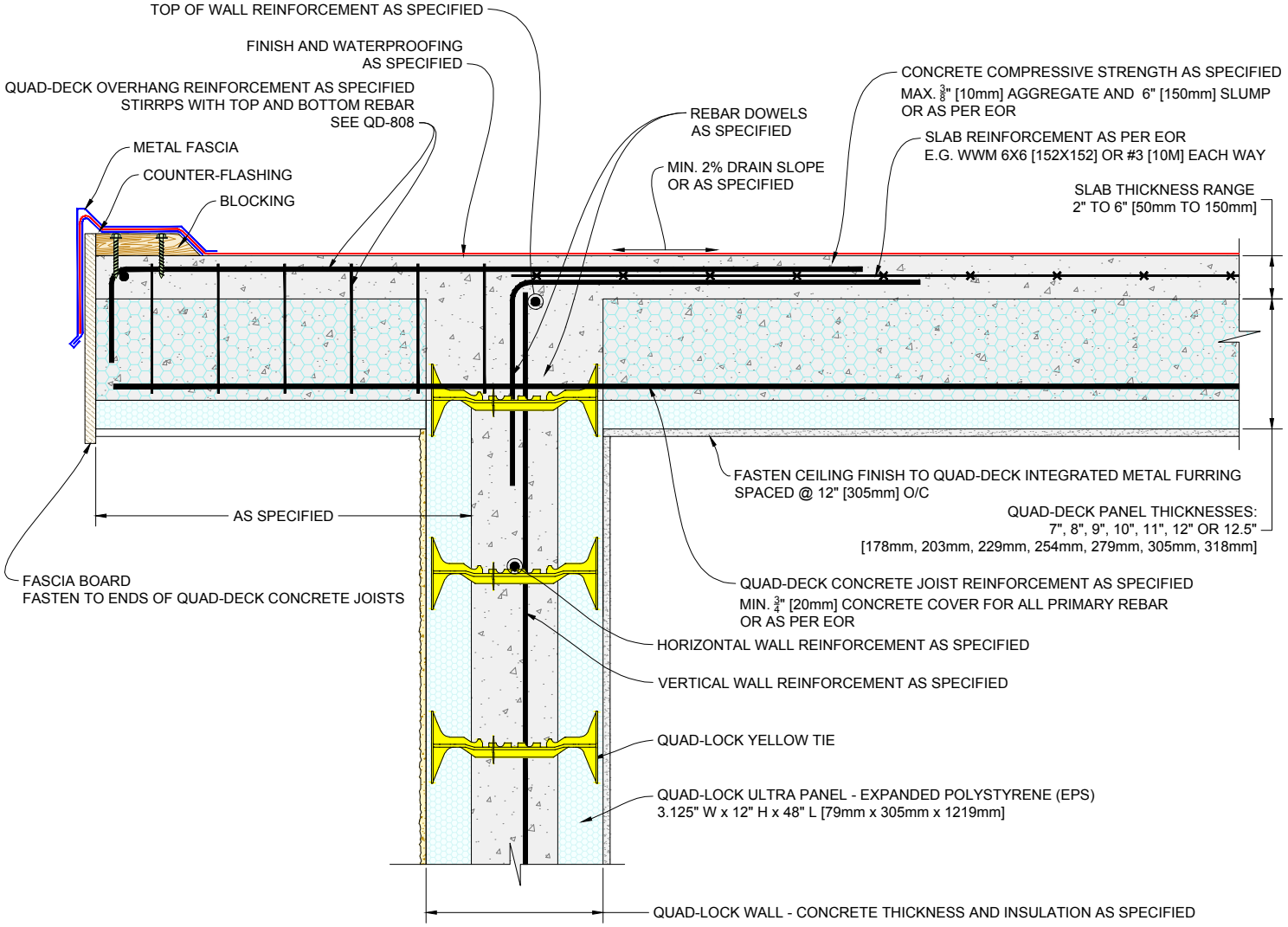
QUAD-DECK FLAT ROOF - CONCRETE OVERHANG

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-507



1 FLAT QUAD-DECK OVERHANG - PANELS PERPENDICULAR TO QUAD-LOCK WALL

Scale: N.T.S.

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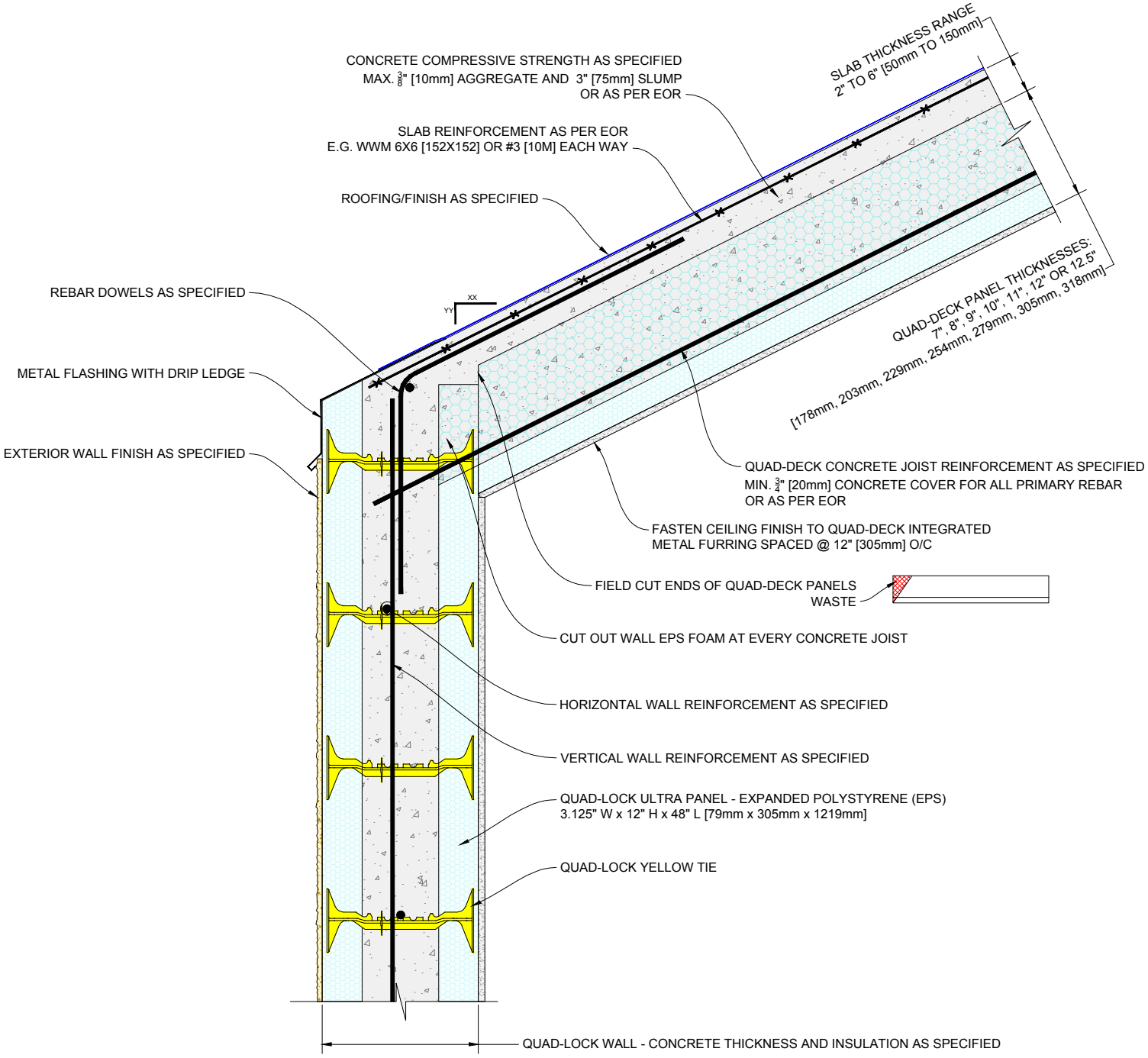
QUAD-DECK FLAT ROOF WITH QUAD-DECK OVERHANG

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-508



1 QUAD-DECK PITCHED WALL TO ROOF DETAIL WITH BUILT IN GUTTER

Scale: N.T.S.

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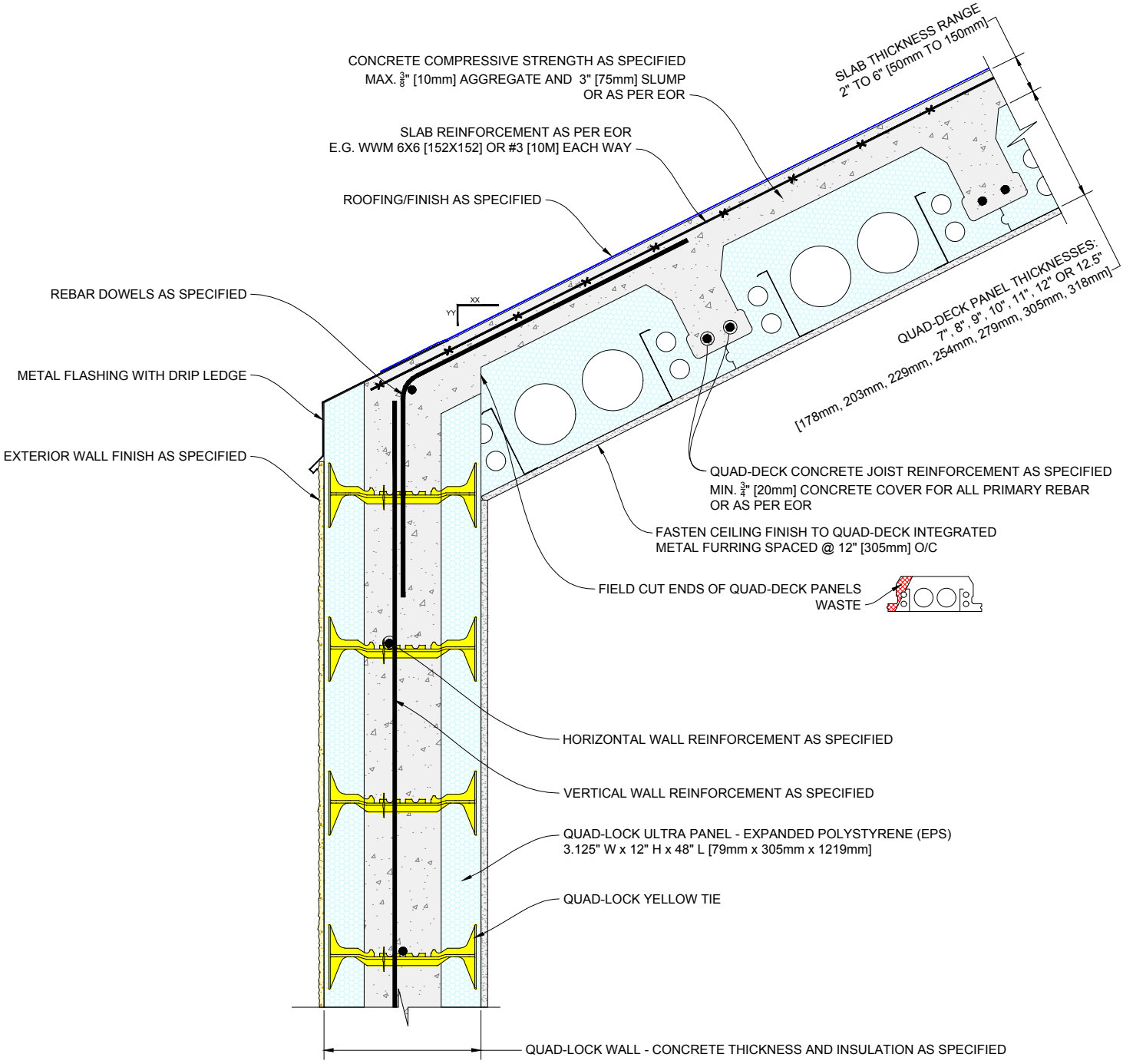
QUAD-DECK PITCHED ROOF TO WALL DETAIL

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-509



1 QUAD-DECK PITCHED WALL TO ROOF DETAIL WITH BUILT IN GUTTER

Scale: N.T.S.

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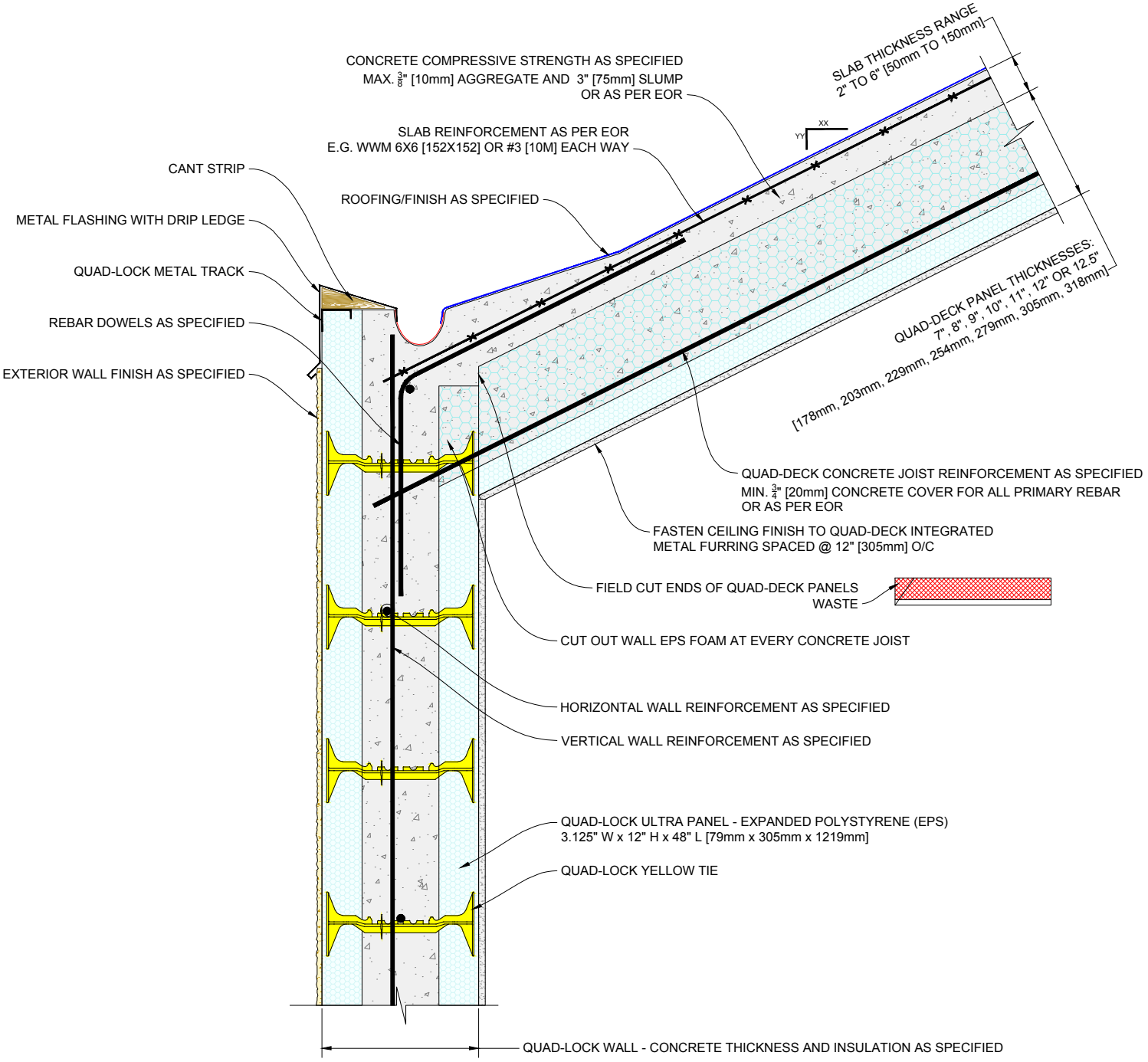
QUAD-DECK PITCHED ROOF TO WALL DETAIL

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-510



1 QUAD-DECK PITCHED WALL TO ROOF DETAIL WITH BUILT IN GUTTER

Scale: N.T.S.

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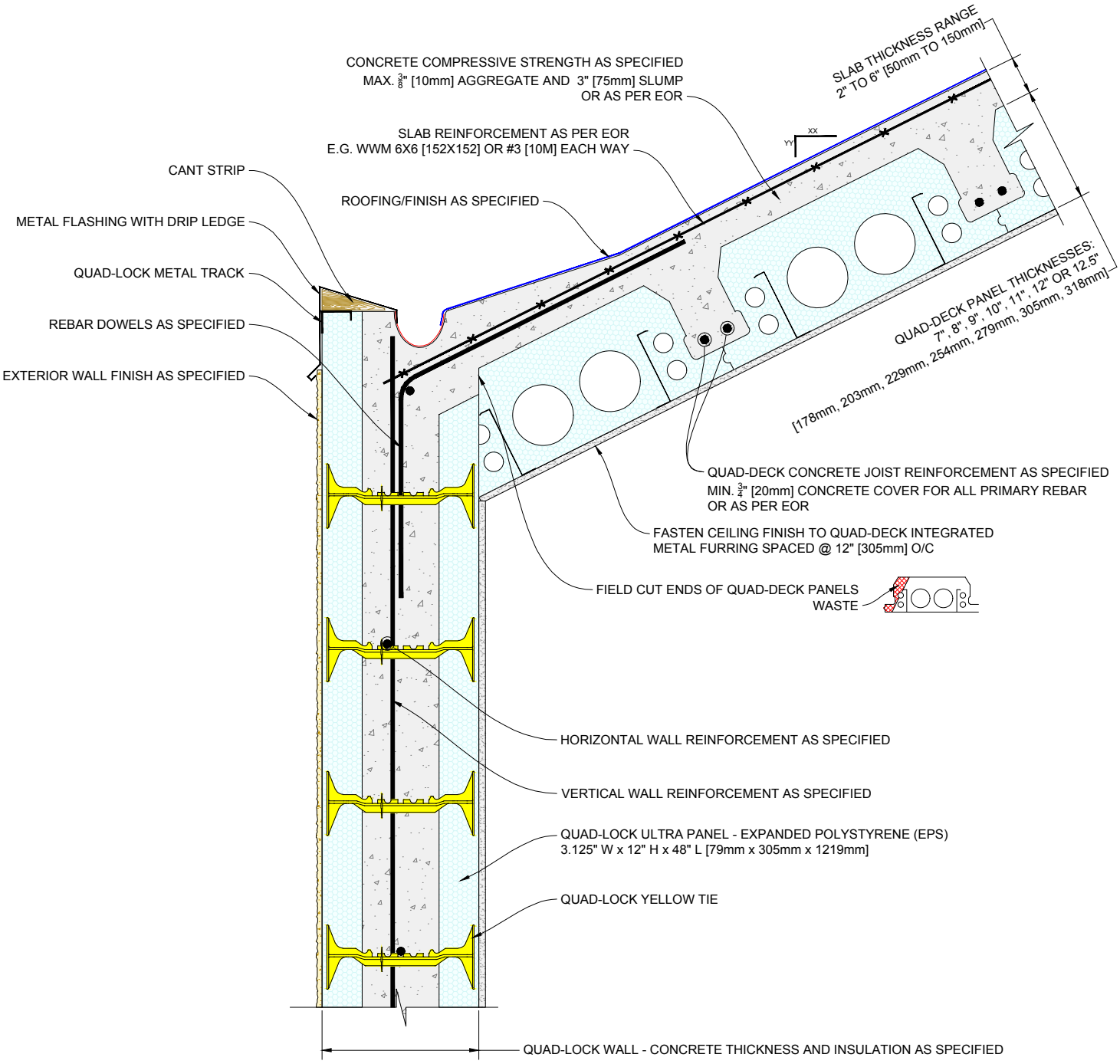
QUAD-DECK PITCHED ROOF TO WALL DETAIL

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-511



1 QUAD-DECK PITCHED WALL TO ROOF DETAIL WITH BUILT IN GUTTER

Scale: N.T.S.

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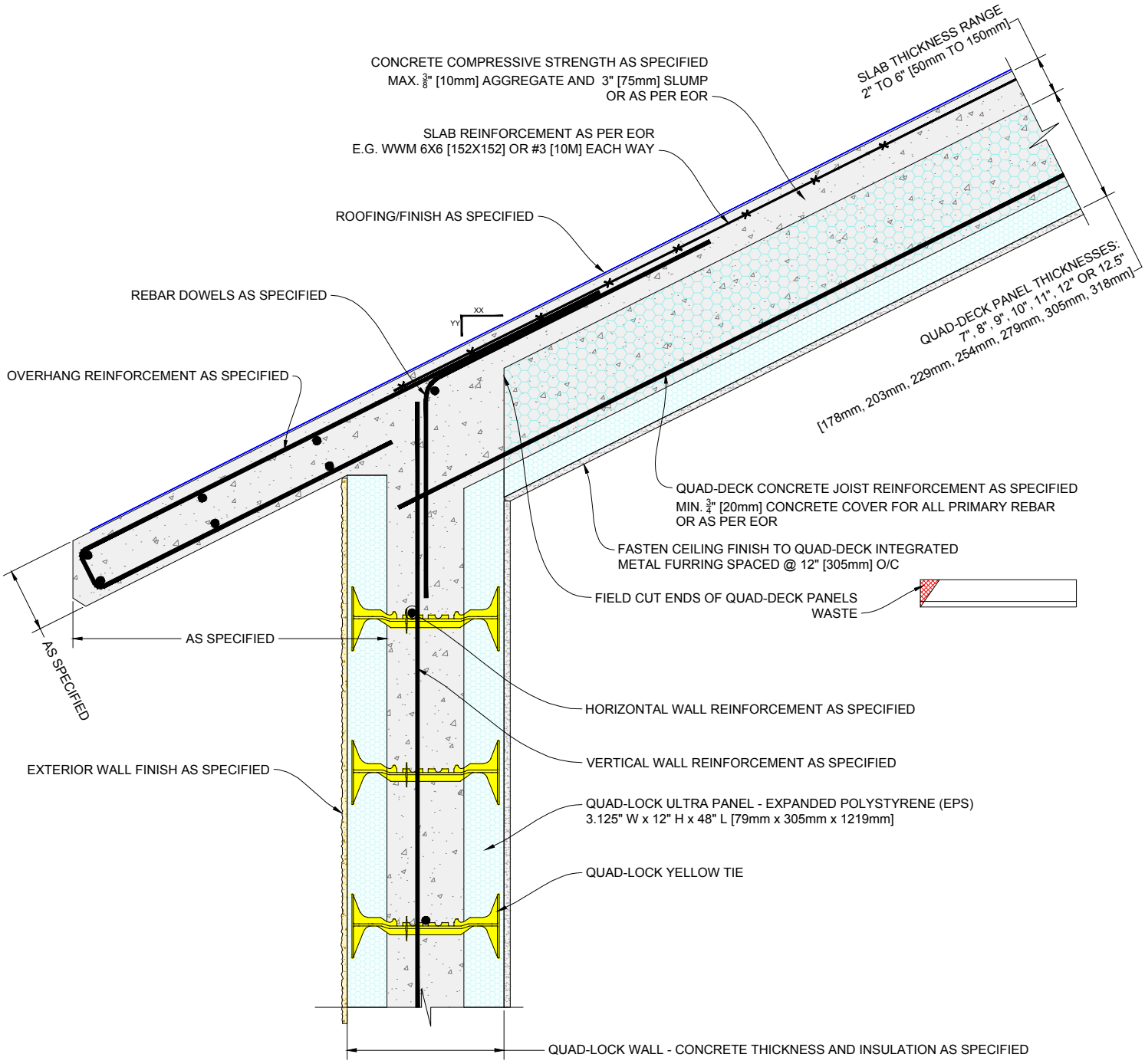
QUAD-DECK PITCHED ROOF TO WALL DETAIL

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-512



1 QUAD-DECK PITCHED WALL TO ROOF DETAIL WITH CONCRETE OVERHANG

Scale: N.T.S.

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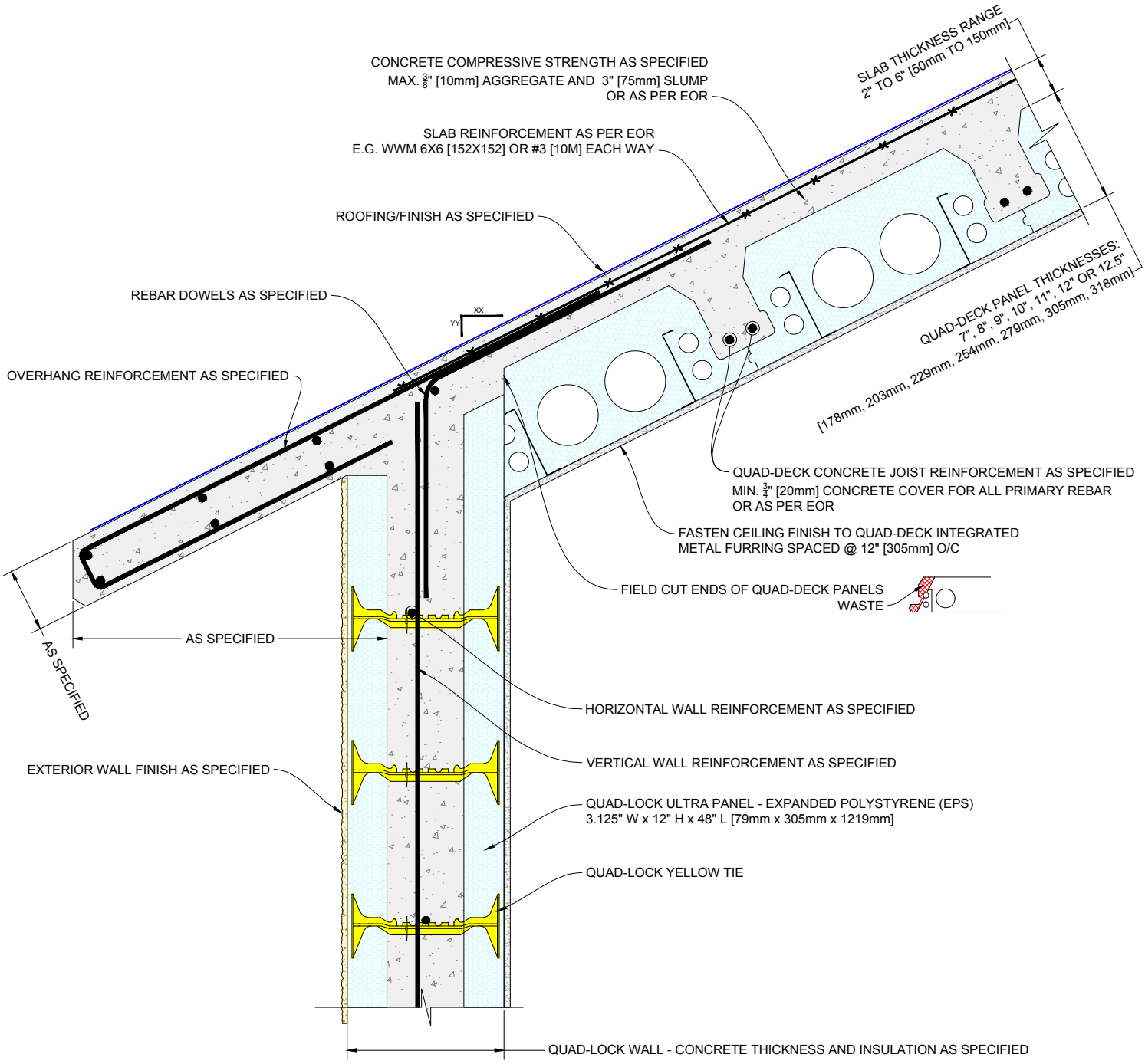
QUAD-DECK PITCHED ROOF WITH CONCRETE OVERHANG

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-513



1 QUAD-DECK PITCHED WALL TO ROOF DETAIL WITH CONCRETE OVERHANG

Scale: N.T.S.

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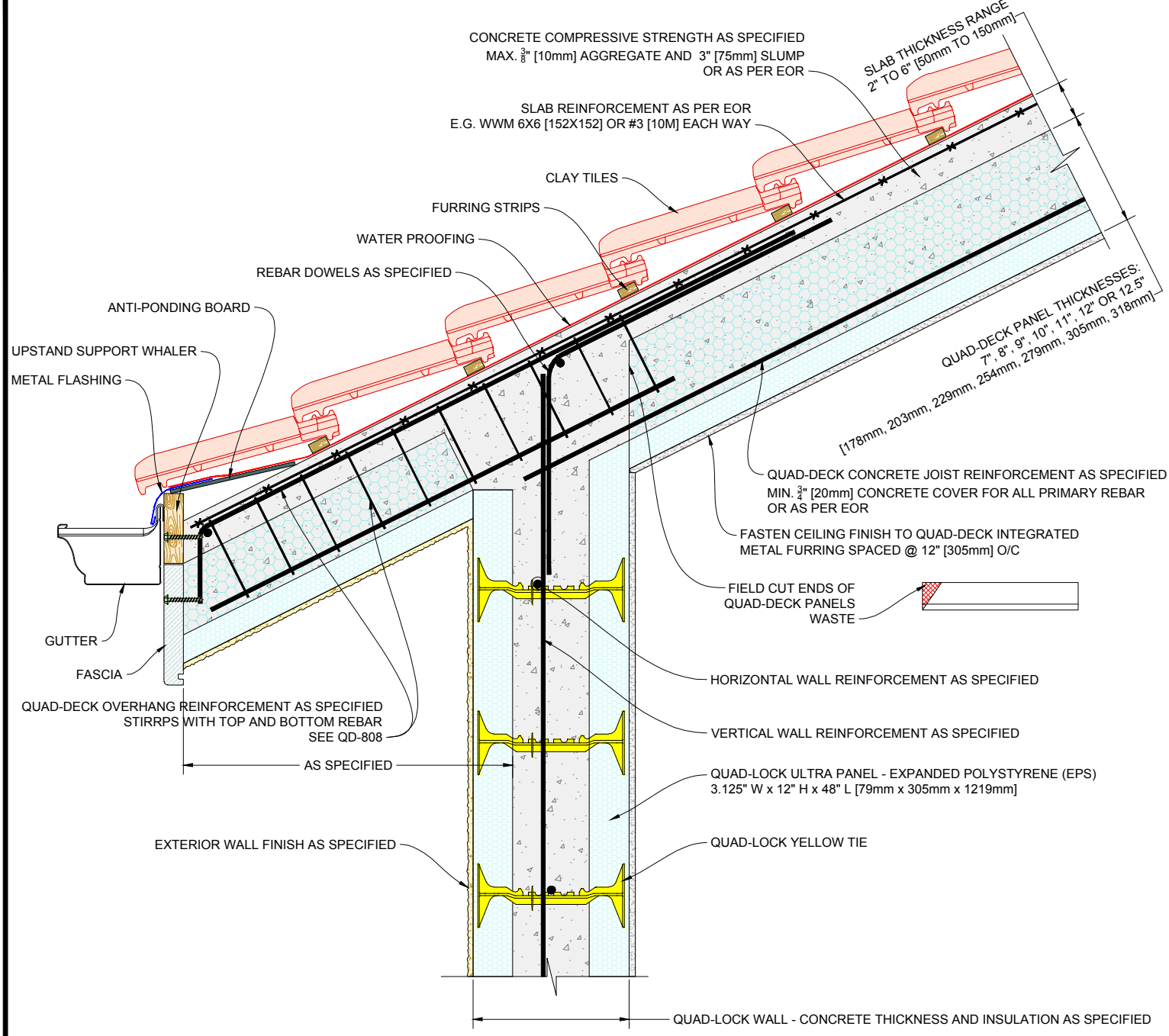
QUAD-DECK PITCHED ROOF WITH CONCRETE OVERHANG

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-514



1 QUAD-DECK PITCHED WALL TO ROOF DETAIL WITH QUAD-DECK OVERHANG

Scale: N.T.S.

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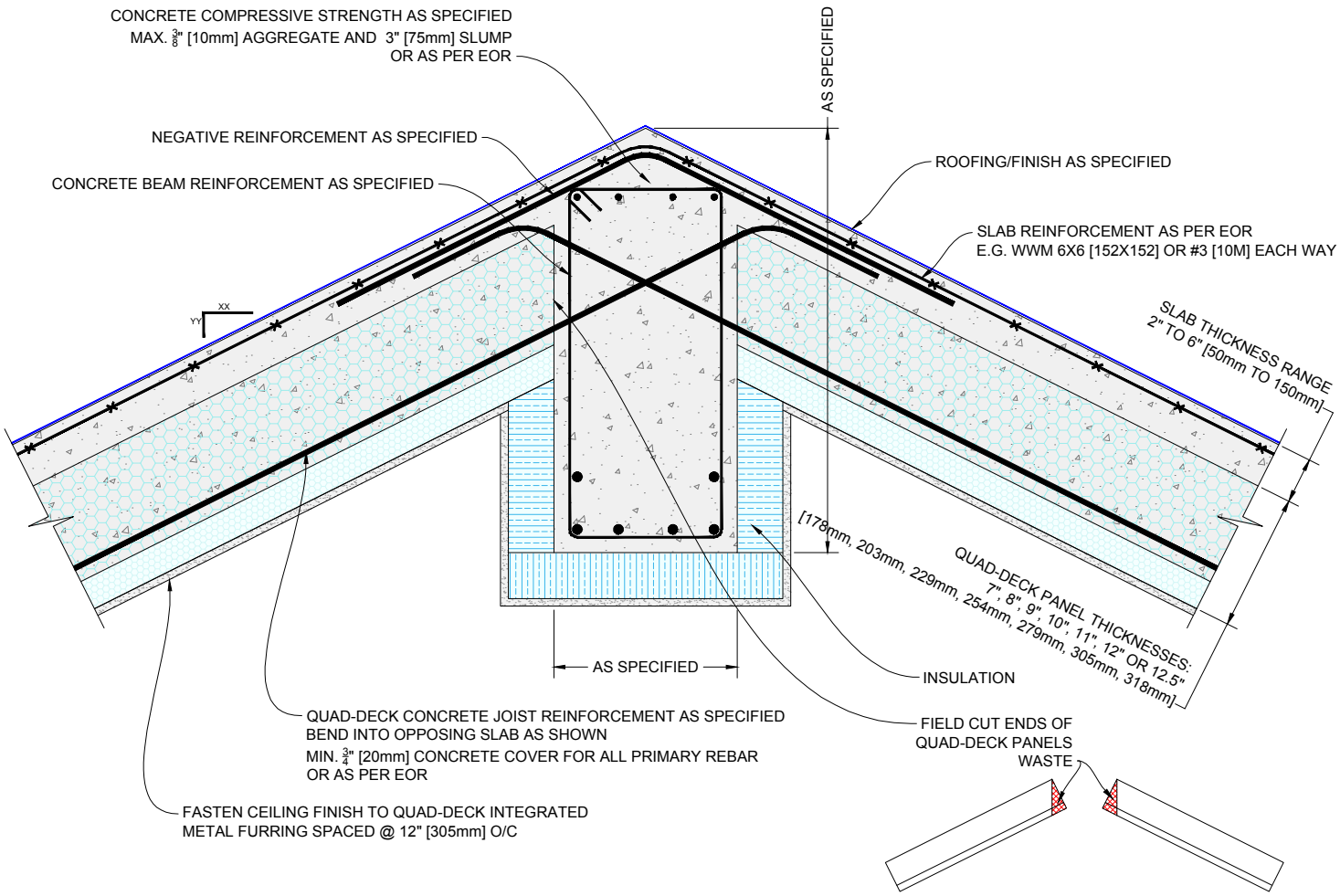
QUAD-DECK PITCHED ROOF WITH QUAD-DECK OVERHANG

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-515



1 DROPPED RIDGE BEAM DETAIL - QUAD-DECK PANELS PERPENDICULAR TO BEAM

Scale: N.T.S.

NOTE:

This scenario is typically used for vaulted ceilings
without column supports where the beam clear spans from gable to gable

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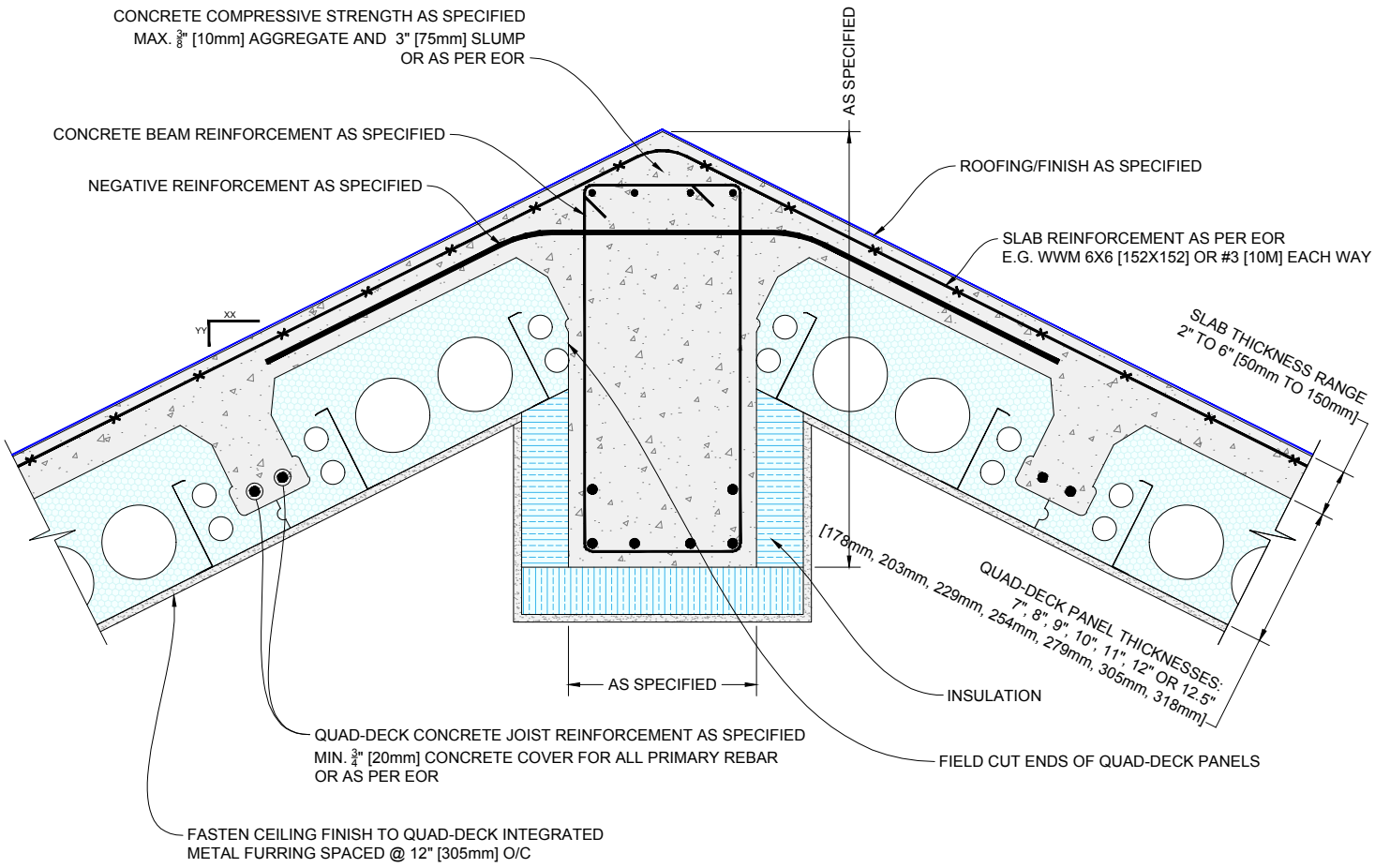
QUAD-DECK DROPPED RIDGE BEAM

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN
		DRAWING NO:	QD-516



1 DROPPED RIDGE BEAM DETAIL - QUAD-DECK PANELS PARALLEL TO BEAM

Scale: N.T.S.

NOTE:

This scenario is typically used for vaulted ceilings
without column supports where the beam clear spans from gable to gable

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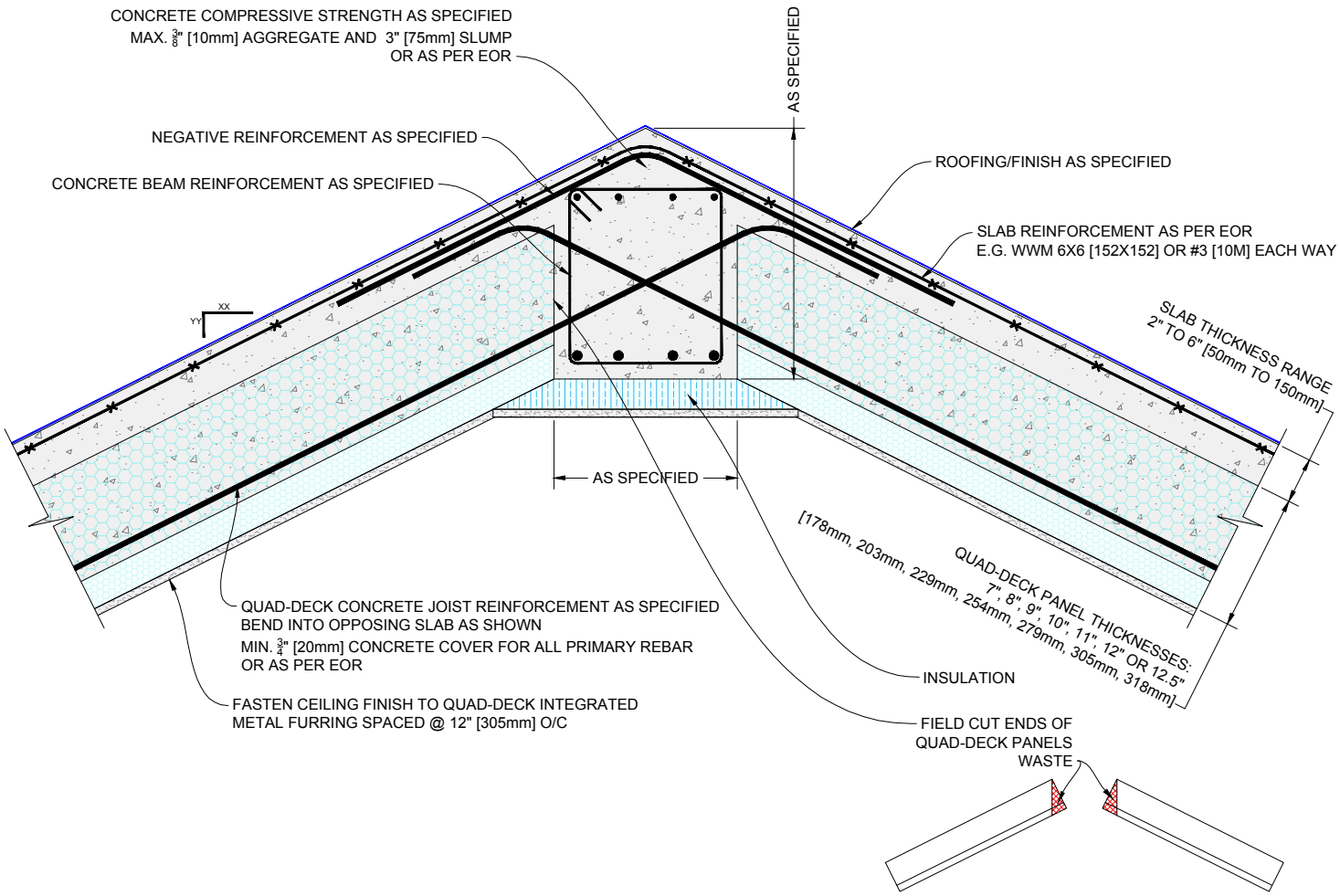
QUAD-DECK DROPPED RIDGE BEAM

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-517



1 FLUSHED RIDGE BEAM DETAIL - QUAD-DECK PANELS PERPENDICULAR TO BEAM

Scale: N.T.S.

NOTE:

This scenario is typically used with for shorter spans and/or with internal support elements such as columns

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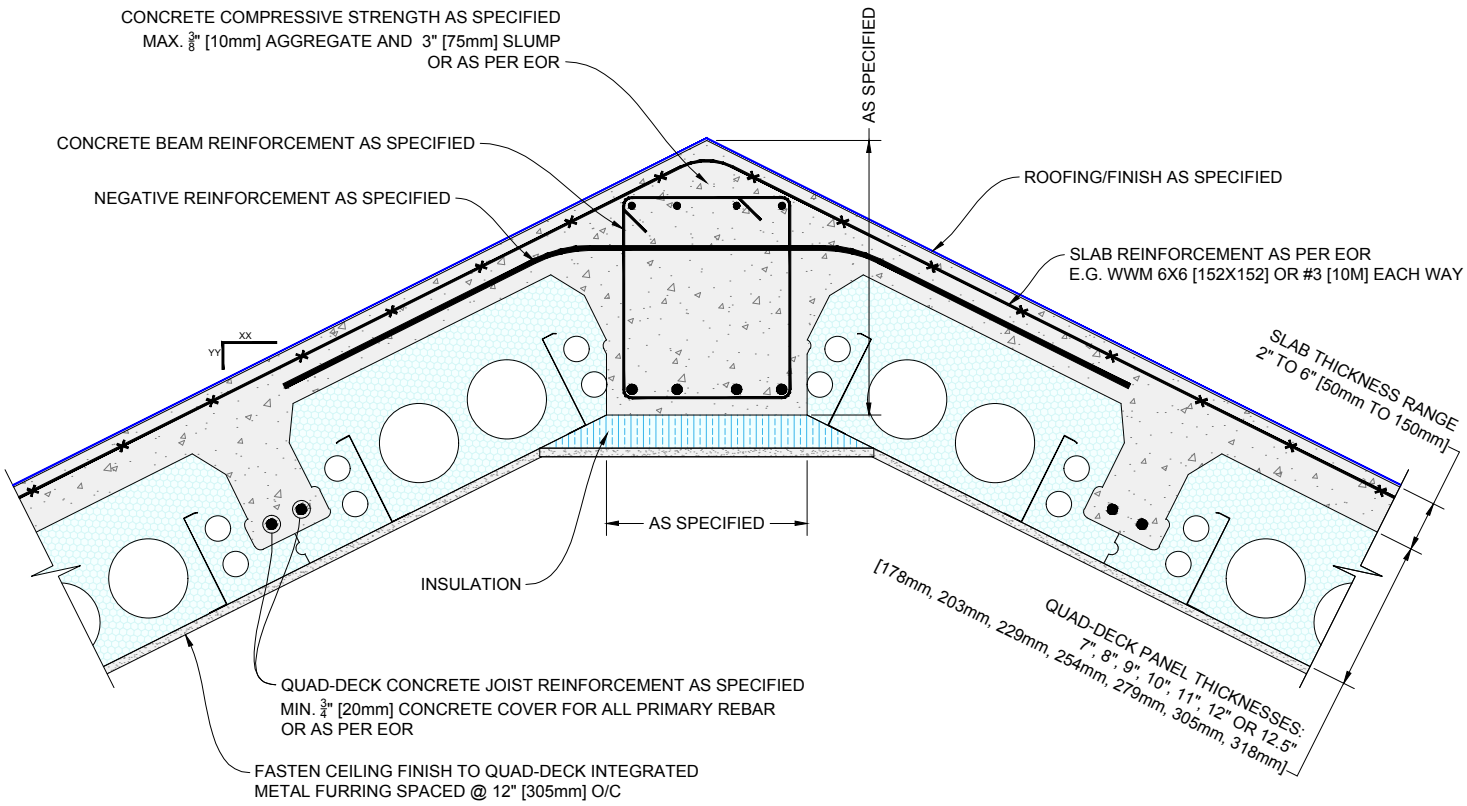
QUAD-DECK FLUSHED RIDGE BEAM

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-518



1 FLUSHED RIDGE BEAM DETAIL - QUAD-DECK PANELS PARALLEL TO BEAM

Scale: N.T.S.

NOTE:

This scenario is typically used with for shorter spans and/or with internal support elements such as columns

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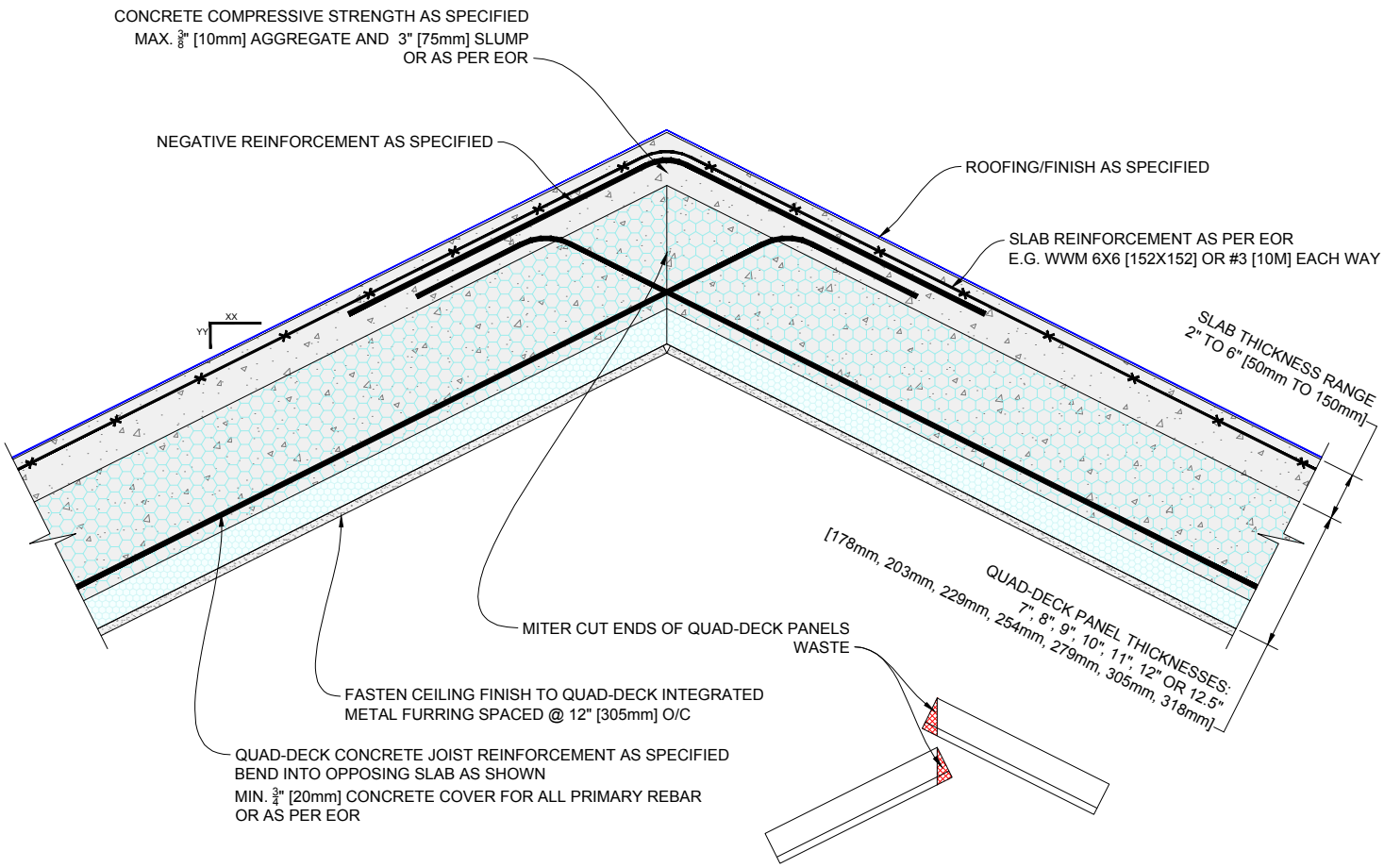
QUAD-DECK FLUSHED RIDGE BEAM

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-519



1 MITERED RIDGE DETAIL - QUAD-DECK PANELS PERPENDICULAR TO BEAM

Scale: N.T.S.

NOTE:

This design is typically used for hip roofs
or with horizontal collar ties that span from eve to eve to resist walls moving out laterally

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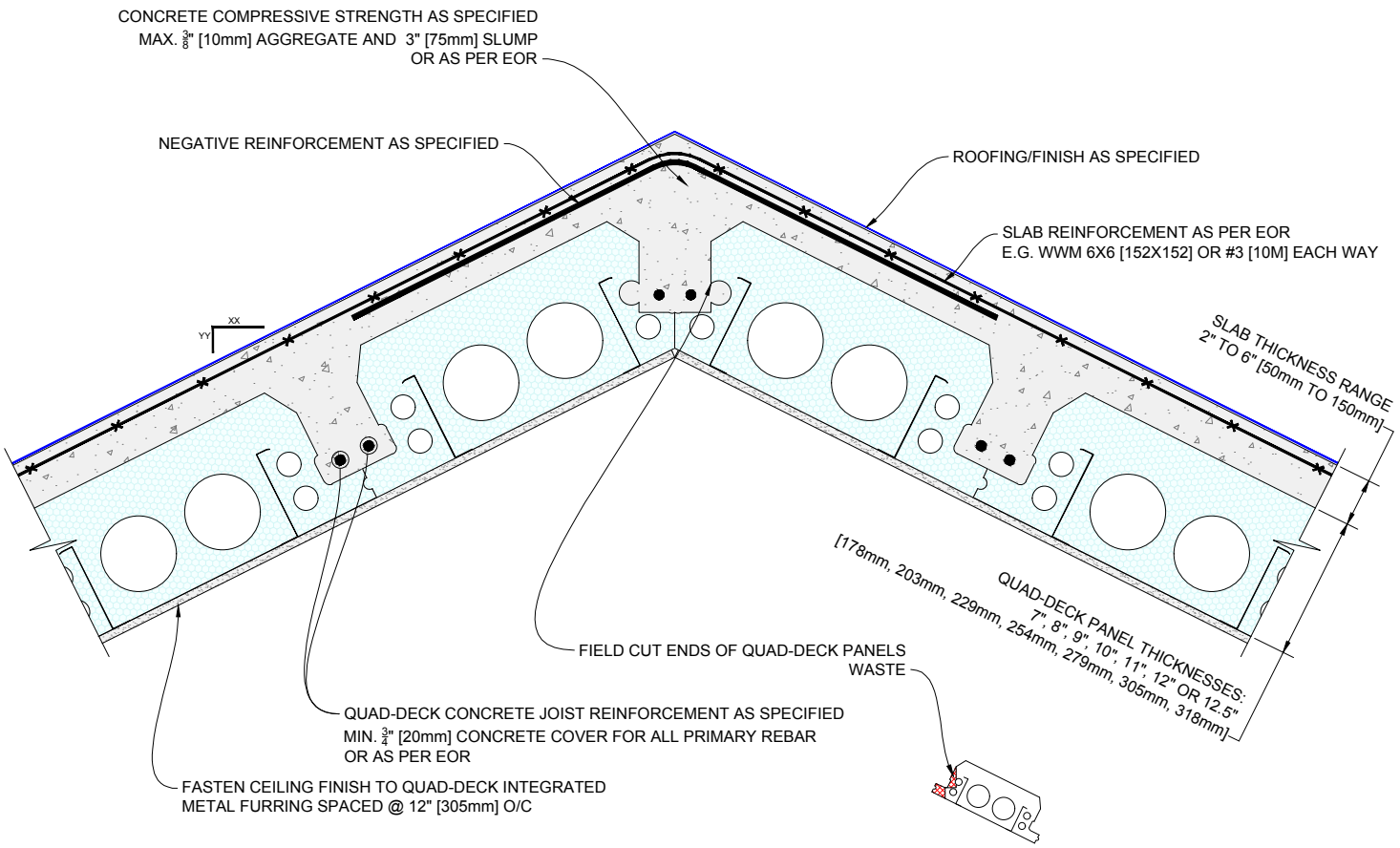
QUAD-DECK MITERED RIDGE

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-520



1 MITERED RIDGE DETAIL - QUAD-DECK PANELS PARALLEL TO BEAM

Scale: N.T.S.

NOTE:

This scenario is typically used with for shorter spans and/or with internal support elements such as columns

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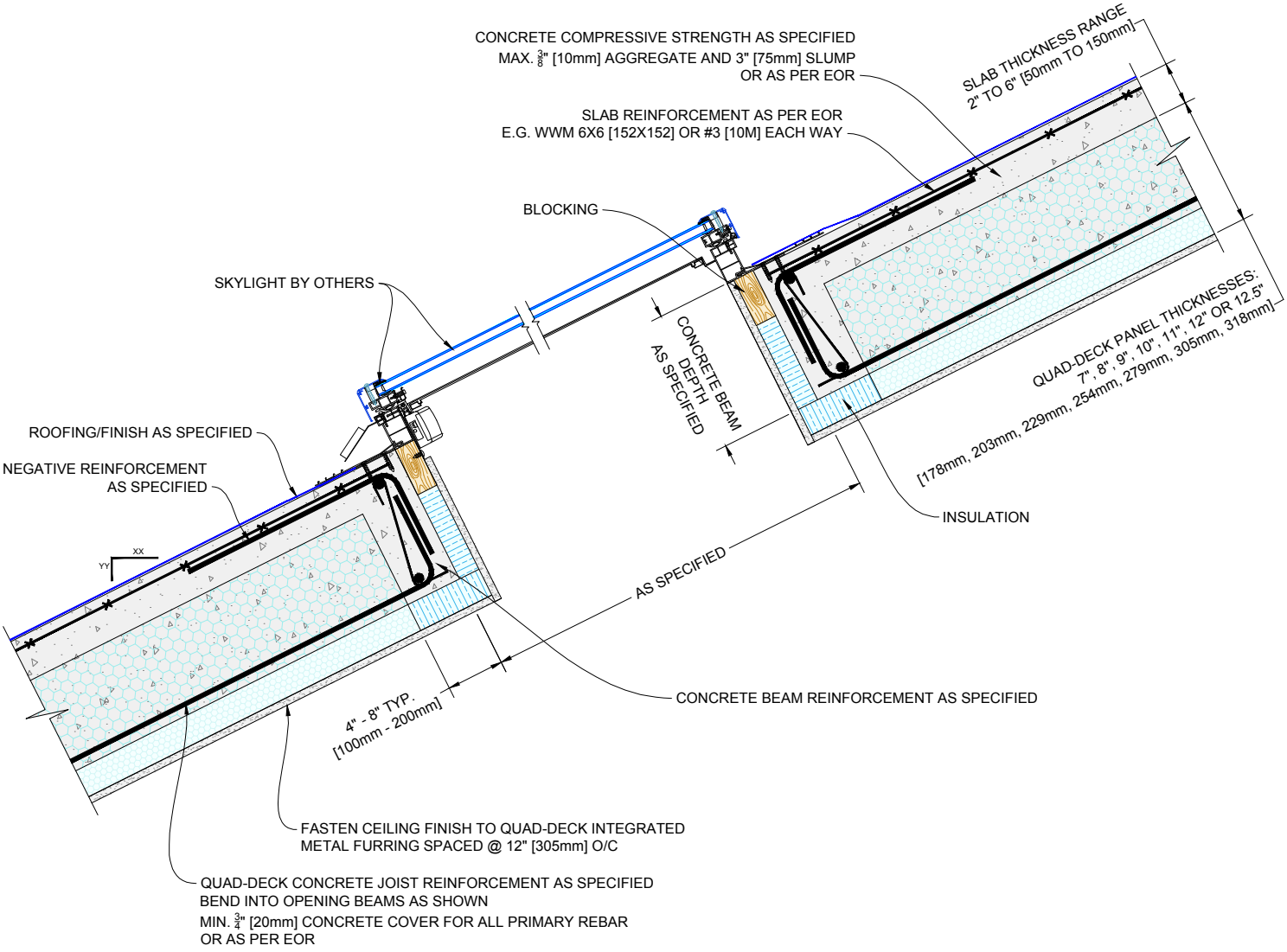
QUAD-DECK MITERED RIDGE

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-521



1 SKYLIGHT DETAIL - QUAD-DECK PANELS PERPENDICULAR TO BEAM

Scale: N.T.S.

NOTE:

Also refer to detail QD-313

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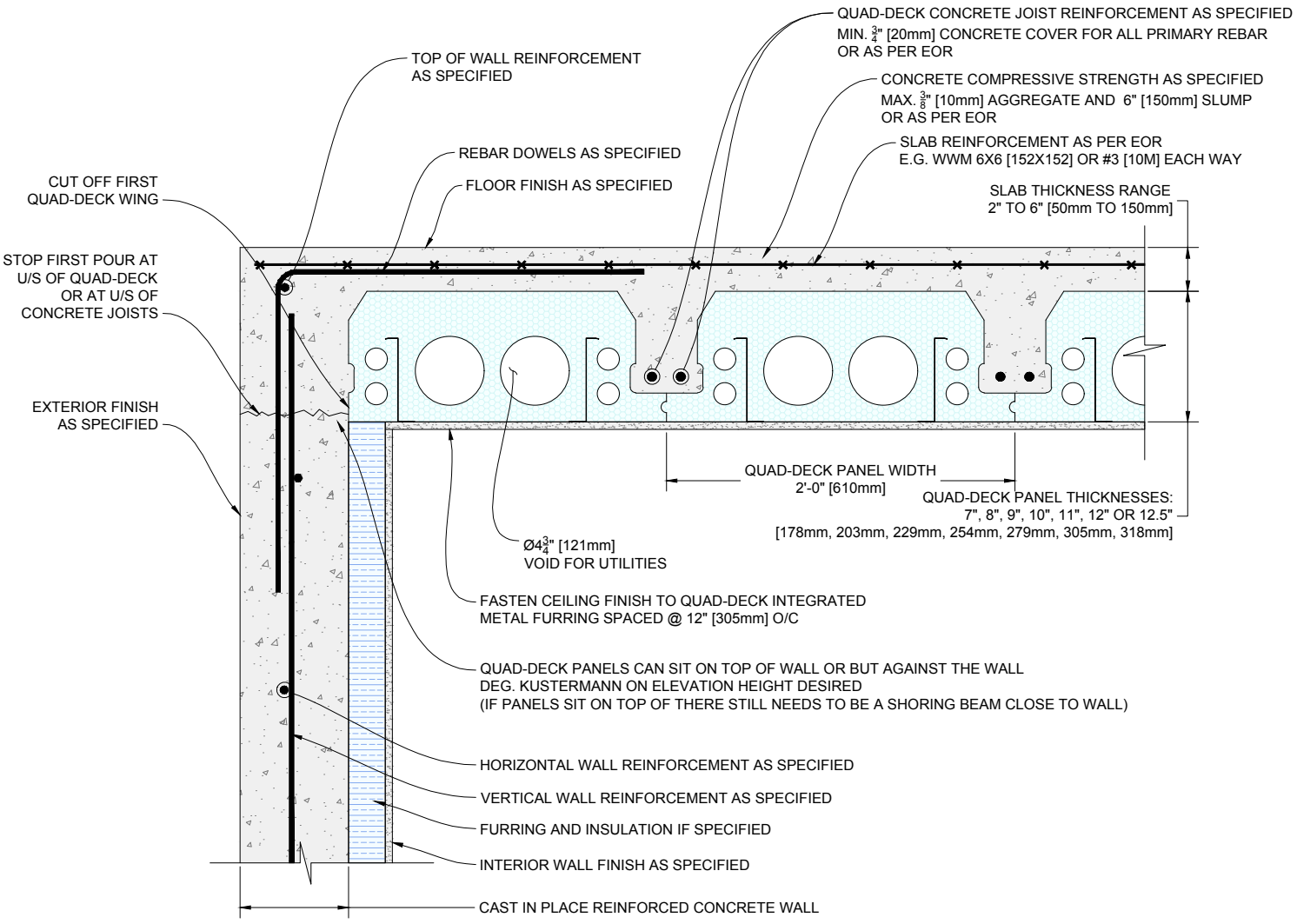
QUAD-DECK SKYLIGHT DETAIL

DATE DRAWN:	2015-03-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-522



1 QUAD-DECK PANELS PARALLEL TO TOP OF CONCRETE WALL

Scale: N.T.S.

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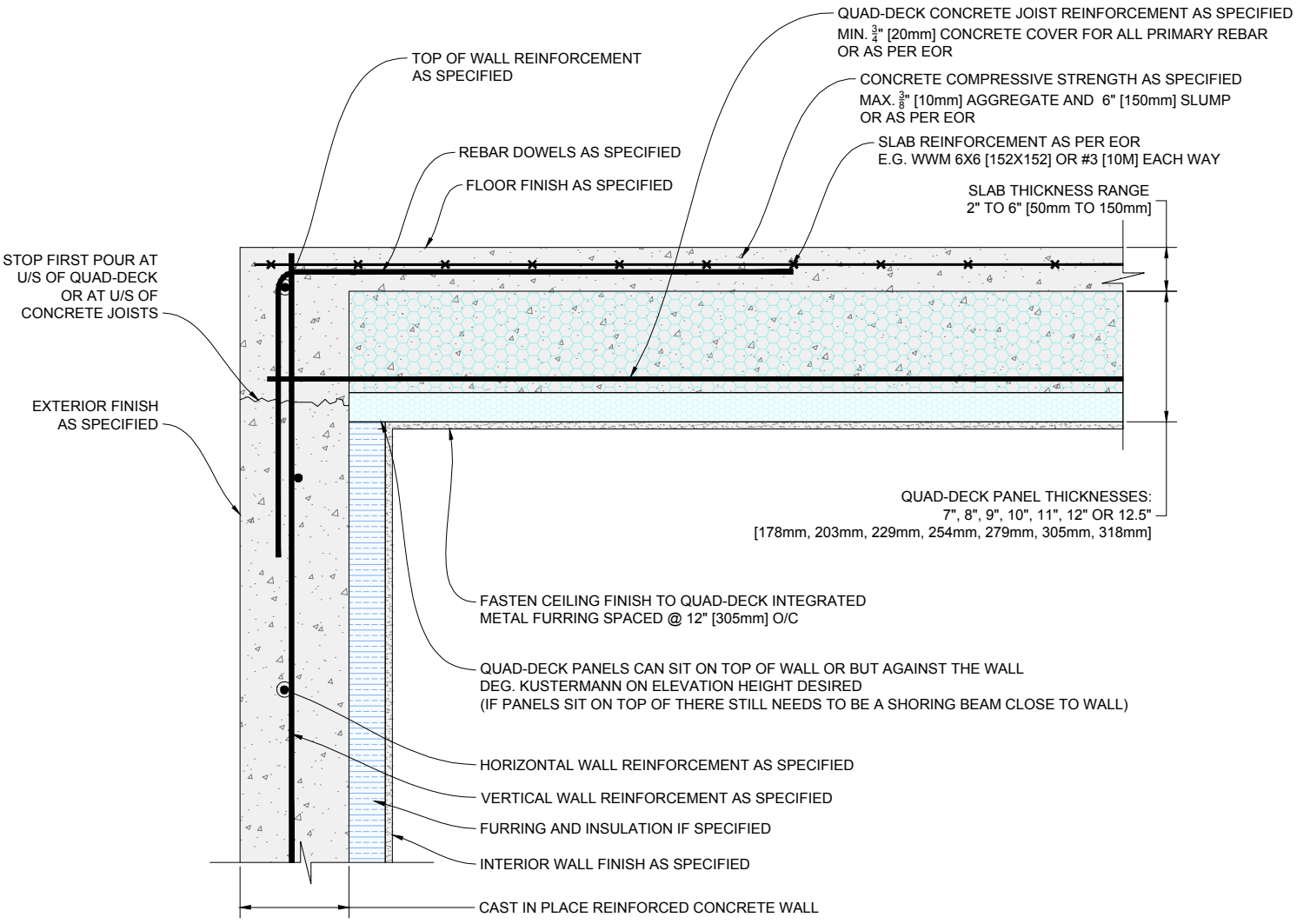
QUAD-DECK PANELS PARALLEL TO TOP OF CONCRETE WALL

DATE DRAWN:	2015-08-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-601



1 QUAD-DECK PANELS PERPENDICULAR TO TOP OF CONCRETE WALL

Scale: N.T.S.

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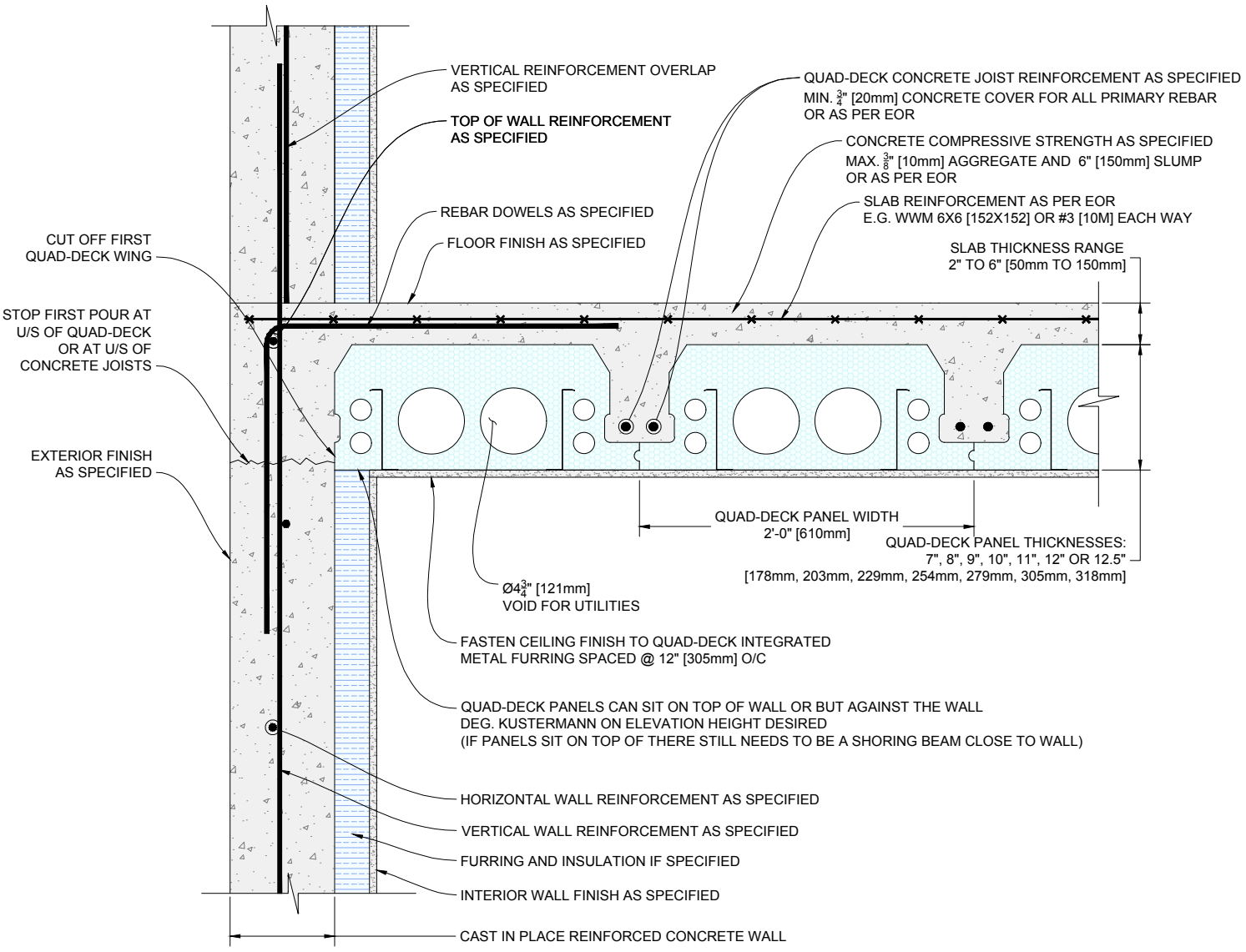
QUAD-DECK PANELS PERPENDICULAR TO TOP OF CONCRETE WALL

DATE DRAWN: 2015-08-15		COMMENTS: N/A	
REVISION NO: YYYY-MM-DD		SHEET SIZE: 8.5" x 11" [216mm x 279mm]	
REVISION DATE: N/A		SCALE: NOT TO SCALE	DRAWING NO: QD-602
DRAWN BY: Z. PROSTRAN		APPROVED BY: G. KUSTERMANN	



1 QUAD-DECK PANELS PARALLEL TO CONCRETE WALL

Scale: N.T.S.

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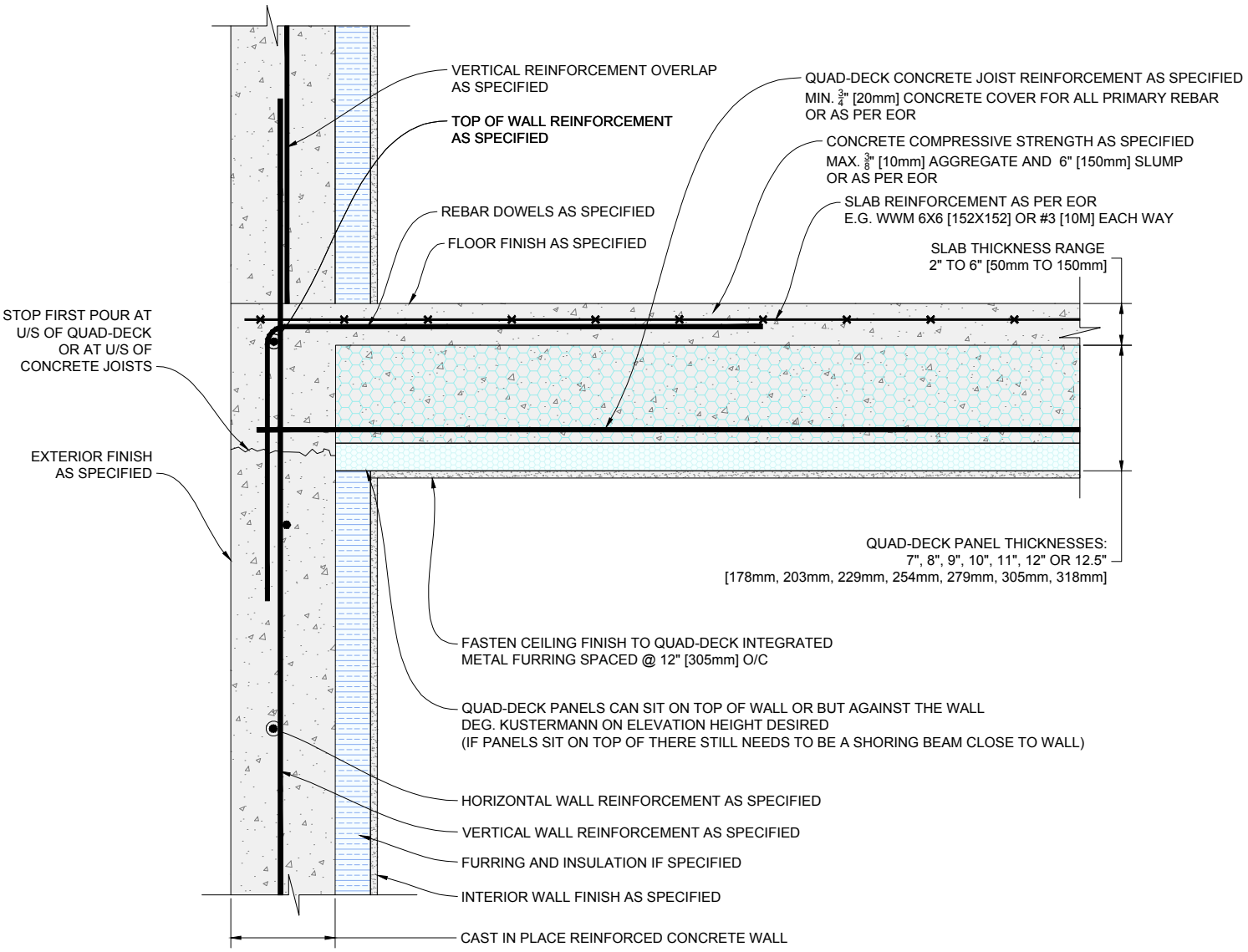
QUAD-DECK PANELS PARALLEL TO CONCRETE WALL

DATE DRAWN:	2015-08-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-603



1 QUAD-DECK PANELS PERPENDICULAR TO CONCRETE WALL

Scale: N.T.S.

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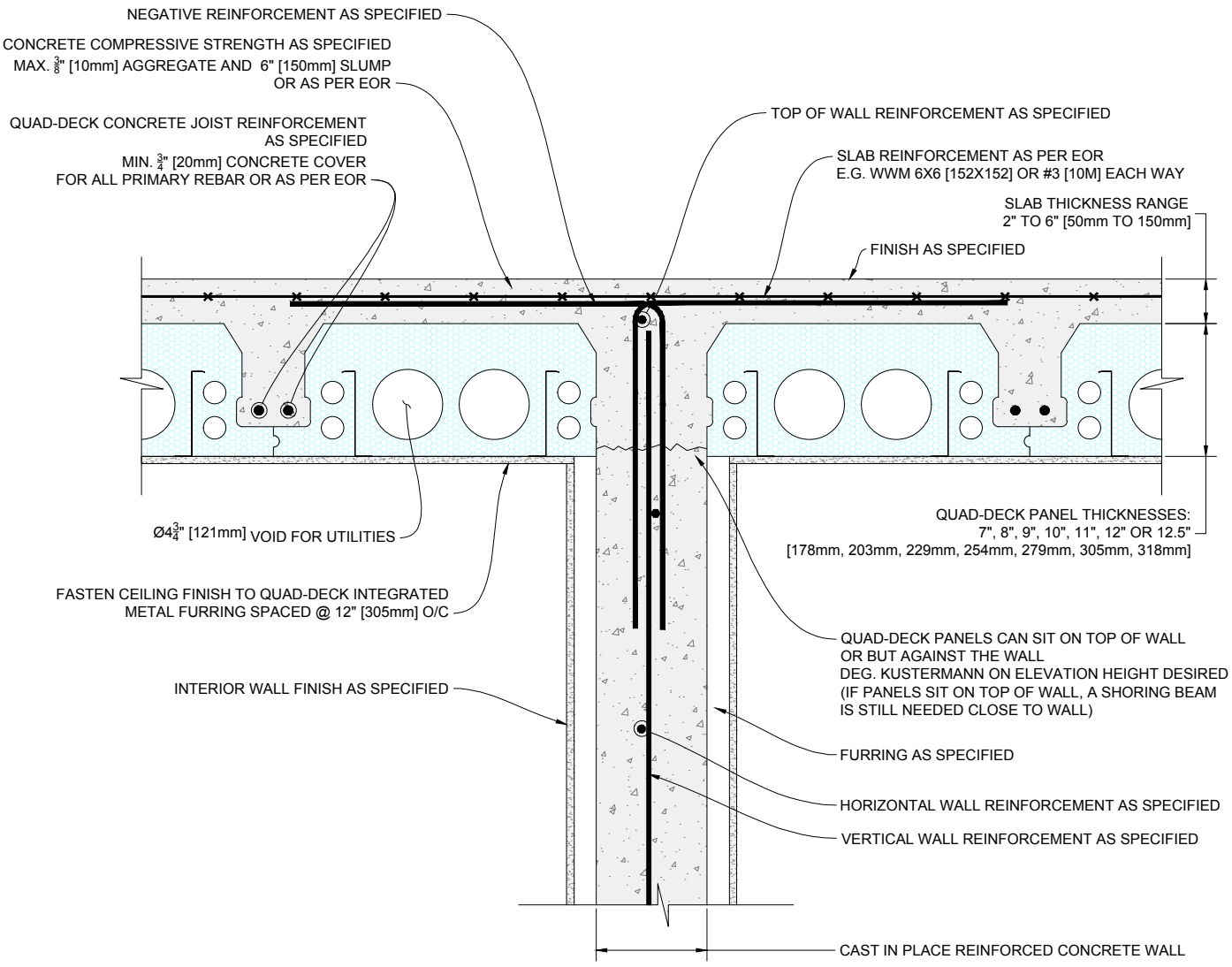
QUAD-DECK PANELS PERPENDICULAR TO CONCRETE WALL

DATE DRAWN:	2015-08-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-604



1 QUAD-DECK PANELS PARALLEL TO TOP OF INTERMEDIATE CONCRETE WALL

Scale: N.T.S.

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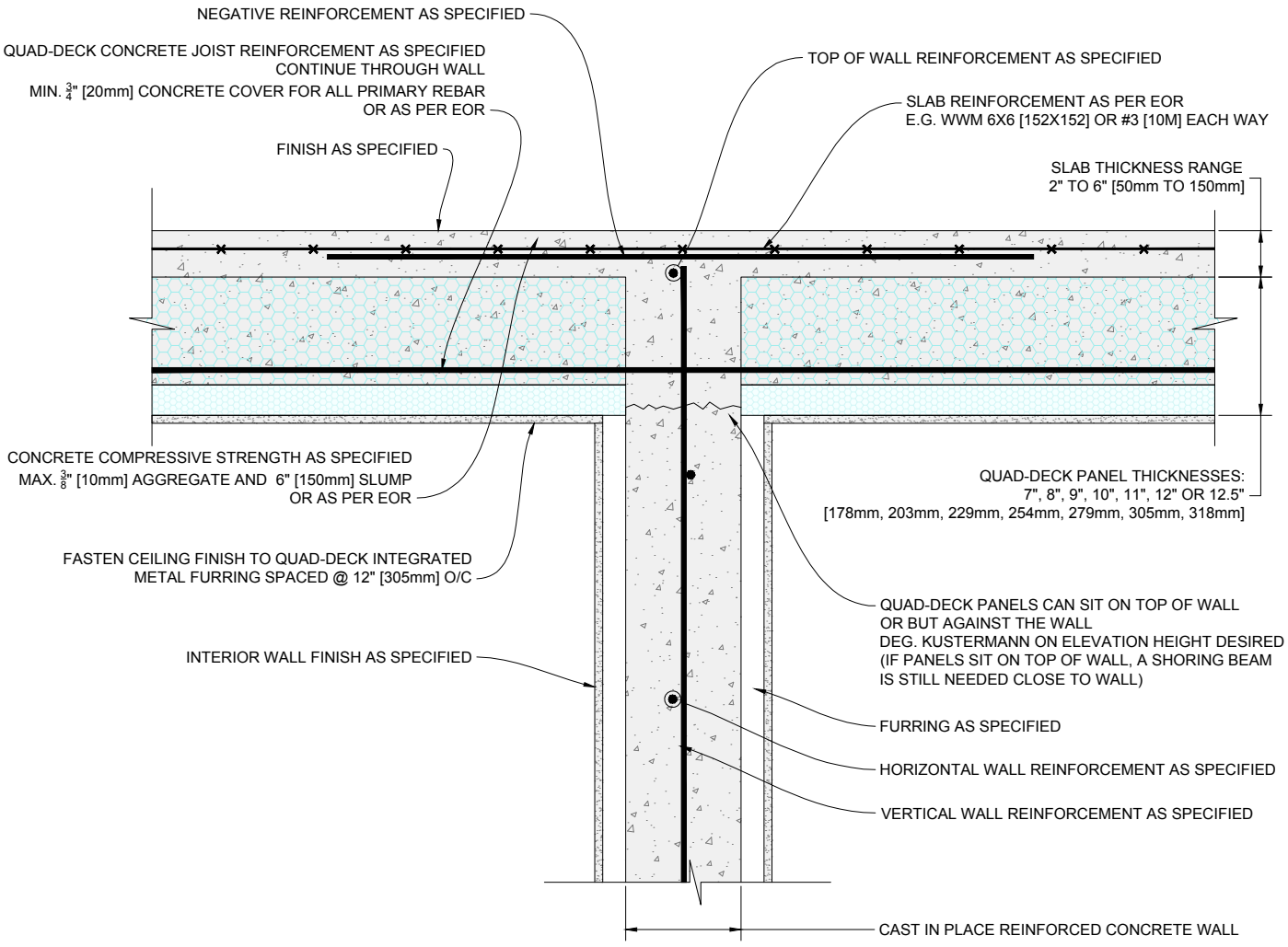
QUAD-DECK PANELS PARALLEL TO TOP OF INTERMEDIATE CONCRETE WALL

DATE DRAWN: 2015-08-15		COMMENTS: N/A	
REVISION NO: YYYY-MM-DD		SHEET SIZE: 8.5" x 11" [216mm x 279mm]	
REVISION DATE: N/A		SCALE: NOT TO SCALE	DRAWING NO: QD-605
DRAWN BY: Z. PROSTRAN		APPROVED BY: G. KUSTERMANN	



1 QUAD-DECK PANELS PERPENDICULAR TO TOP OF INTERMEDIATE CONCRETE WALL

Scale: N.T.S.

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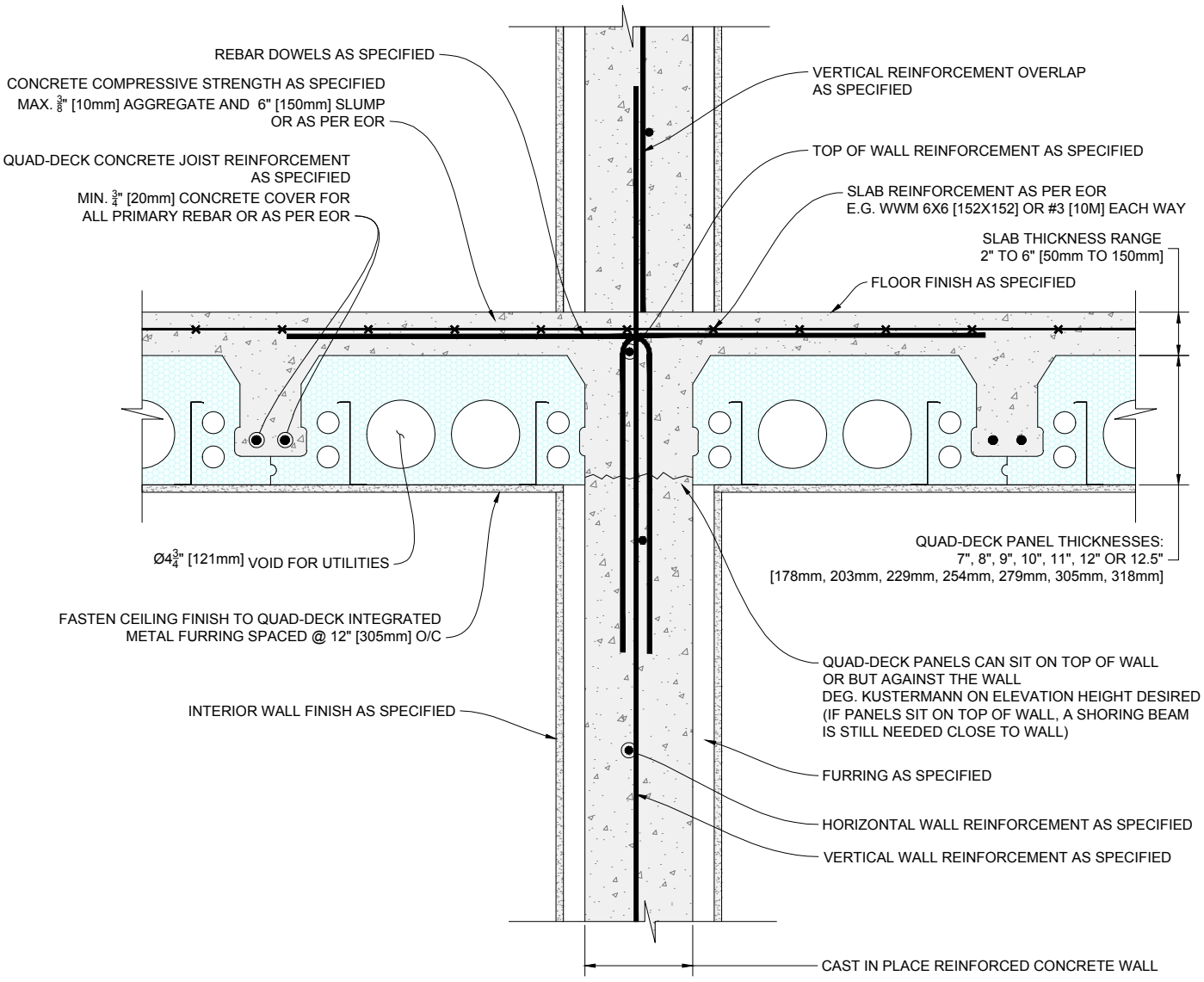
QUAD-DECK PANELS PERPENDICULAR TOP OF INTERMEDIATE CONCRETE WALL

DATE DRAWN:	2015-08-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-606



1 QUAD-DECK PANELS PARALLEL TO INTERMEDIATE CONCRETE WALL

Scale: N.T.S.

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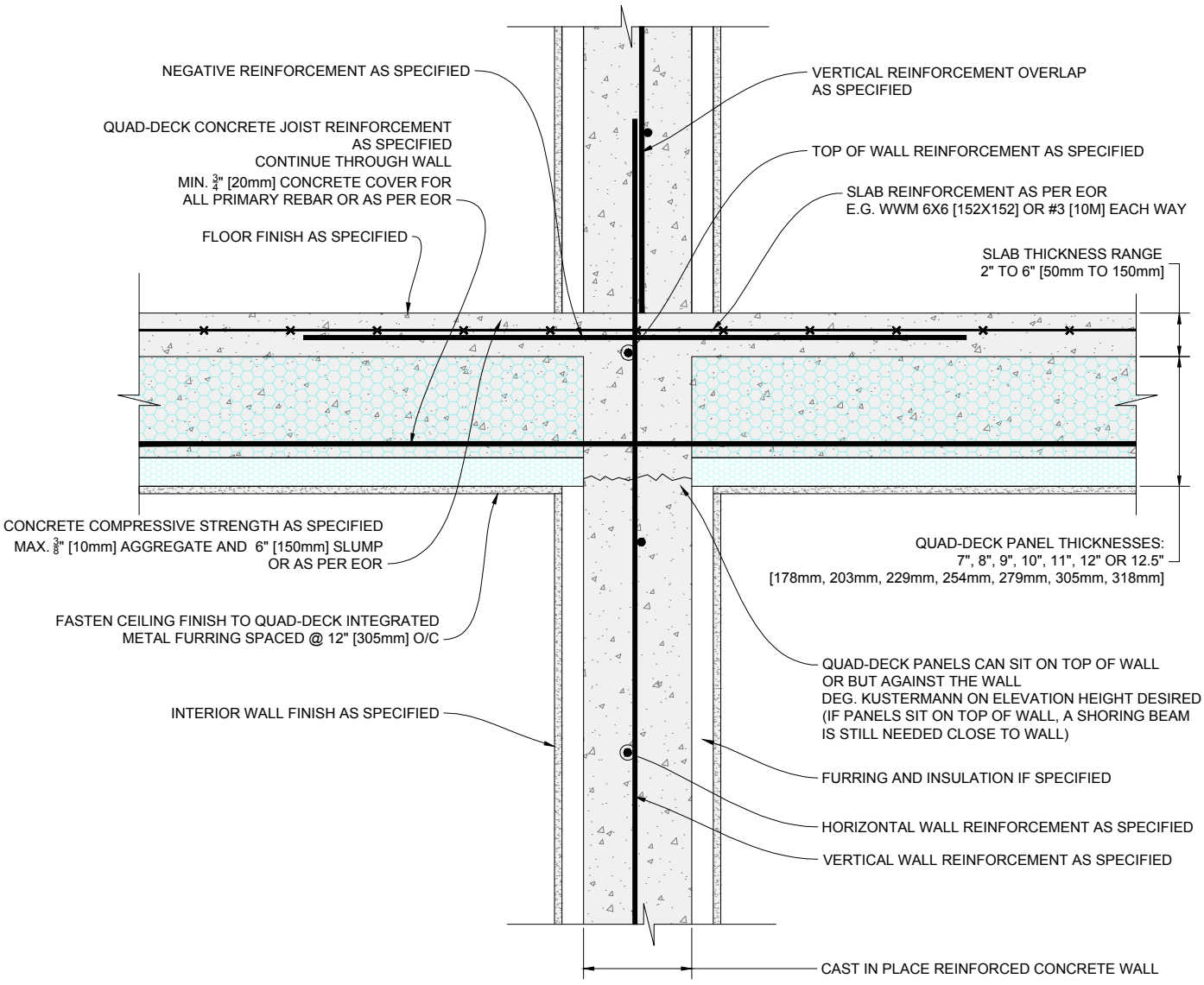
www.quadlock.com

QUAD-DECK PANELS PARALLEL TO INTERMEDIATE CONCRETE WALL

DATE DRAWN: 2015-08-15		COMMENTS: N/A	
REVISION NO: YYYY-MM-DD		SHEET SIZE: 8.5" x 11" [216mm x 279mm]	
REVISION DATE: N/A		SCALE: NOT TO SCALE	DRAWING NO: QD-607
DRAWN BY: Z. PROSTRAN		APPROVED BY: G. KUSTERMANN	



1 QUAD-DECK PANELS PERPENDICULAR TO INTERMEDIATE CONCRETE WALL

Scale: N.T.S.

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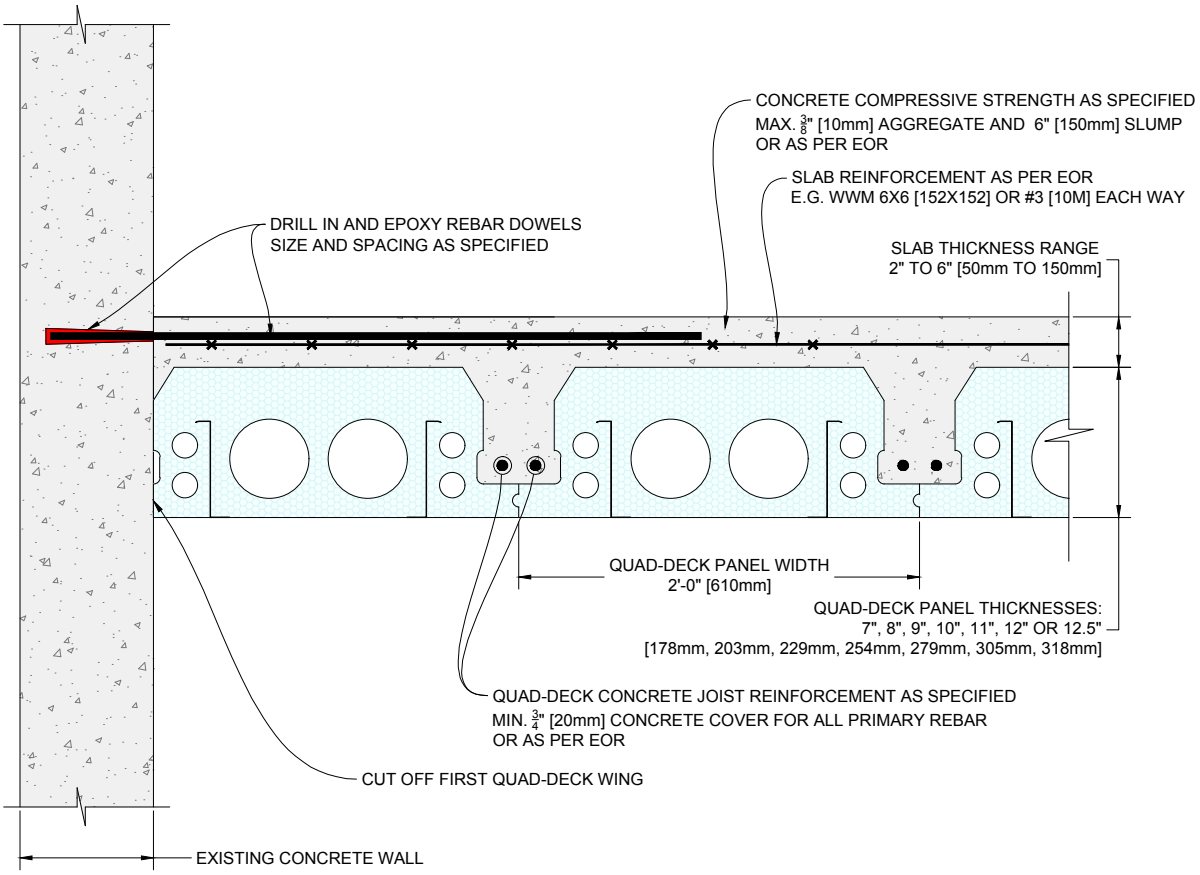
QUAD-DECK PANELS PERPENDICULAR TO INTERMEDIATE CONCRETE WALL

DATE DRAWN: 2015-08-15		COMMENTS: N/A	
REVISION NO: YYYY-MM-DD		SHEET SIZE: 8.5" x 11" [216mm x 279mm]	
REVISION DATE: N/A		SCALE: NOT TO SCALE	DRAWING NO: QD-608
DRAWN BY: Z. PROSTRAN		APPROVED BY: G. KUSTERMANN	



1 QUAD-DECK PANELS PARALLEL TO EXISTING CONCRETE WALL

Scale: N.T.S.

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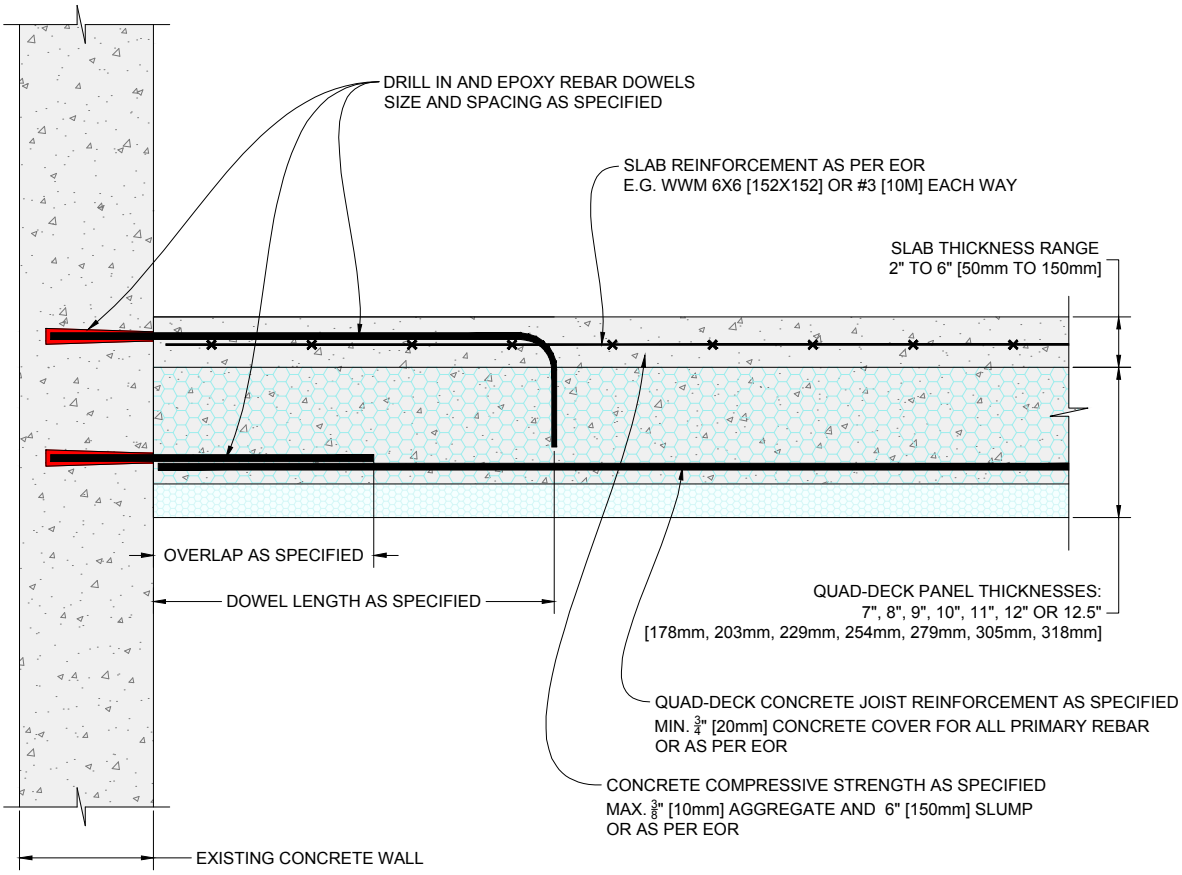
QUAD-DECK PANELS PARALLEL TO EXISTING CONCRETE WALL

DATE DRAWN:	2015-08-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-609



1 QUAD-DECK PANELS PERPENDICULAR TO EXISTING CONCRETE WALL

Scale: N.T.S.

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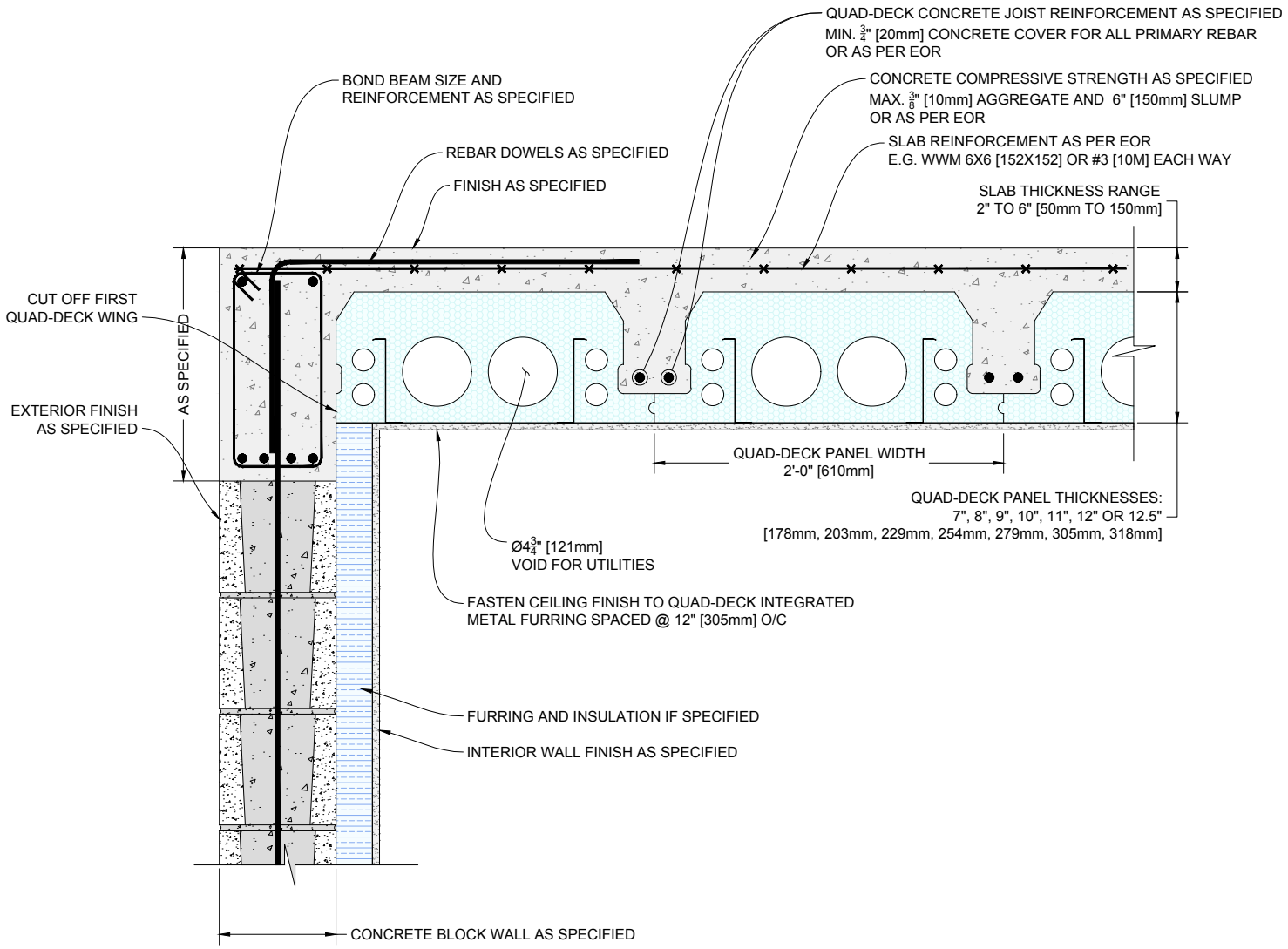
QUAD-DECK PANELS PERPENDICULAR TO EXISTING CONCRETE WALL

DATE DRAWN: 2015-08-15		COMMENTS: N/A	
REVISION NO: YYYY-MM-DD		SHEET SIZE: 8.5" x 11" [216mm x 279mm]	
REVISION DATE: N/A		SCALE: NOT TO SCALE	DRAWING NO: QD-610
DRAWN BY: Z. PROSTRAN		APPROVED BY: G. KUSTERMANN	



1 QUAD-DECK PANELS PARALLEL TO TOP OF CONCRETE BLOCK WALL

Scale: N.T.S.

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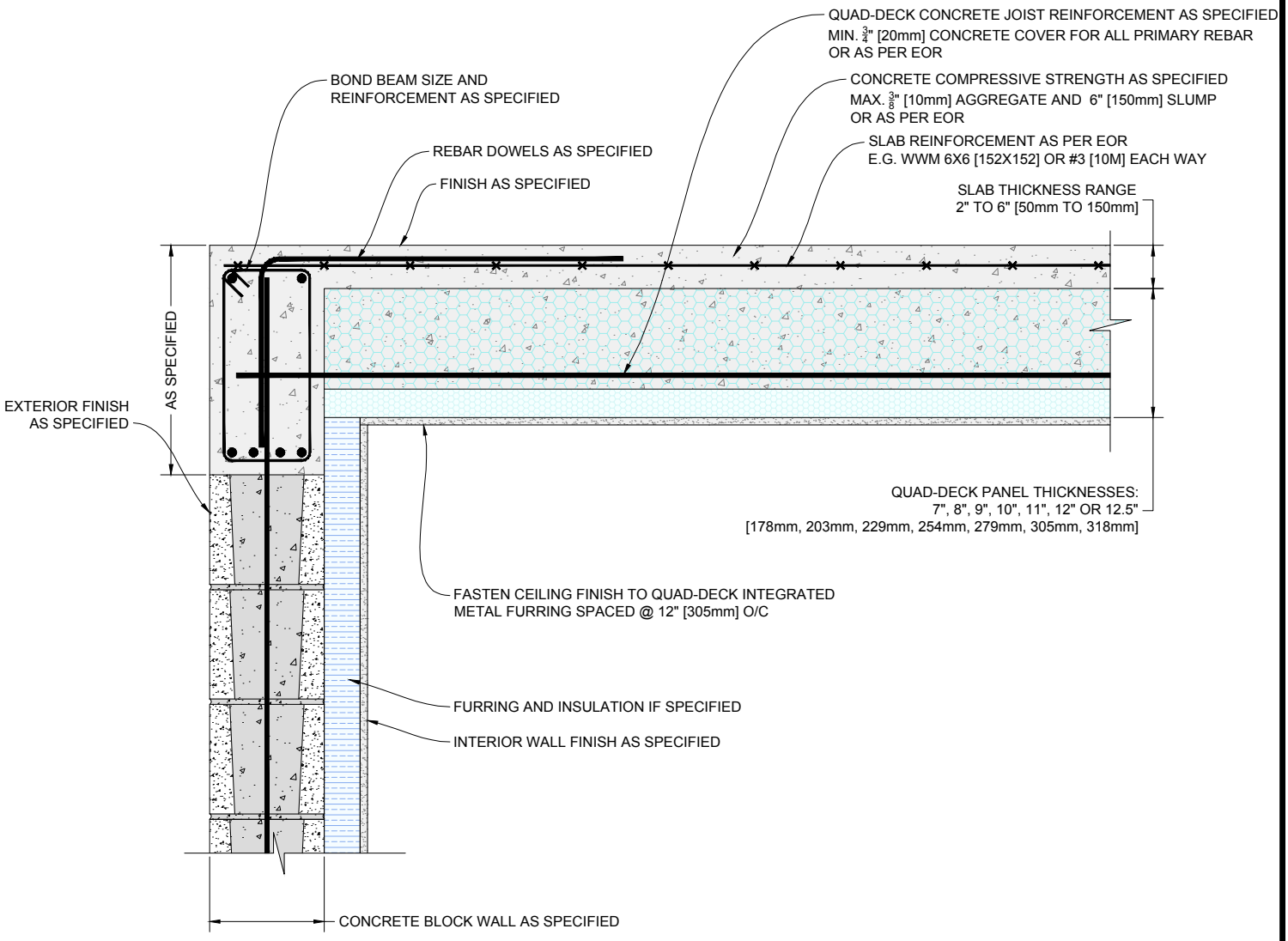
QUAD-DECK PANELS PARALLEL TO TOP OF CONCRETE BLOCK WALL

DATE DRAWN:	2015-08-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-611



1 QUAD-DECK PANELS PERPENDICULAR TO TOP OF CONCRETE BLOCK WALL

Scale: N.T.S.

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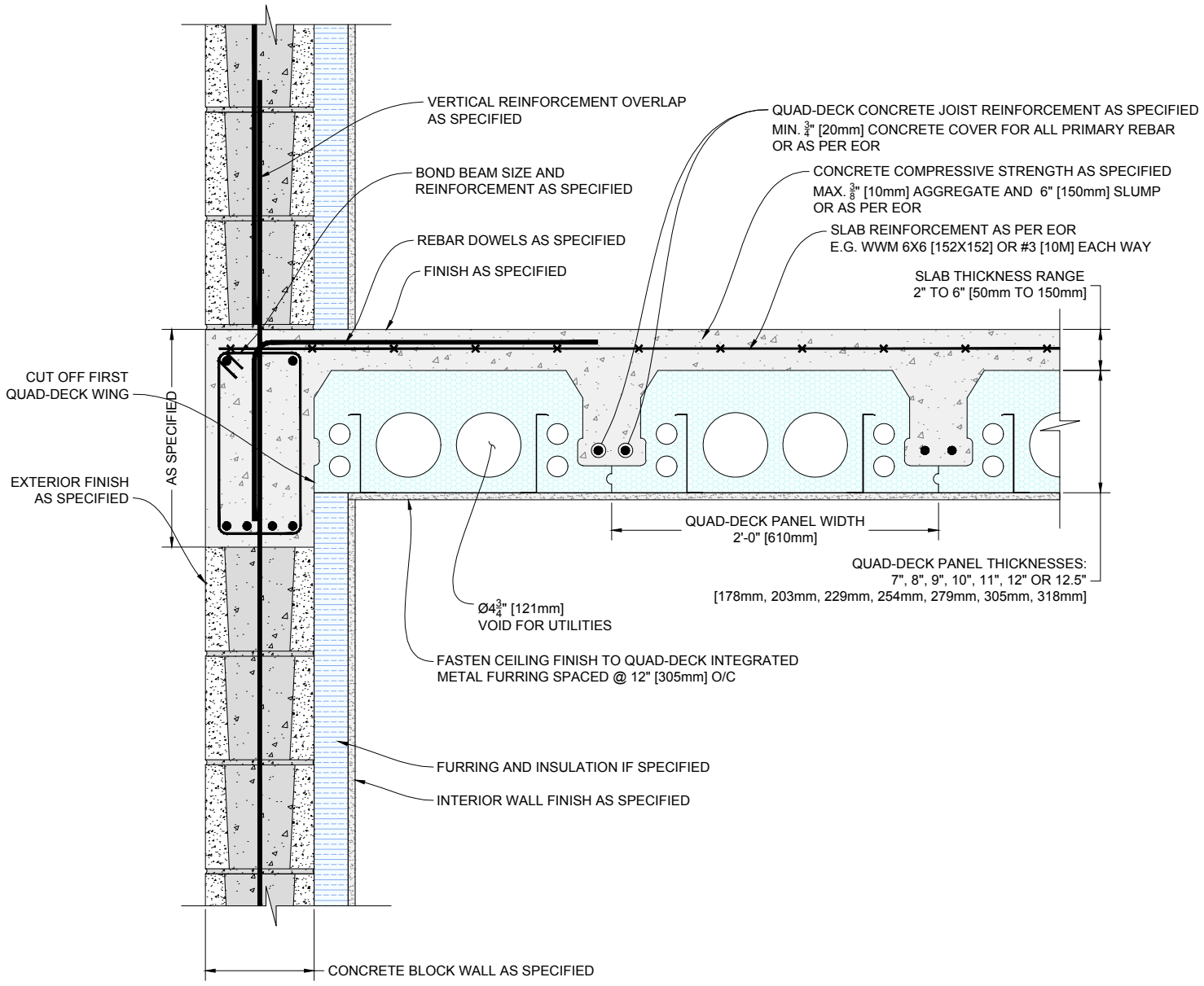
QUAD-DECK PANELS PERPENDICULAR TO TOP OF CONCRETE BLOCK WALL

DATE DRAWN:	2015-08-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-612



1 QUAD-DECK PANELS PARALLEL TO CONCRETE BLOCK WALL

Scale: N.T.S.

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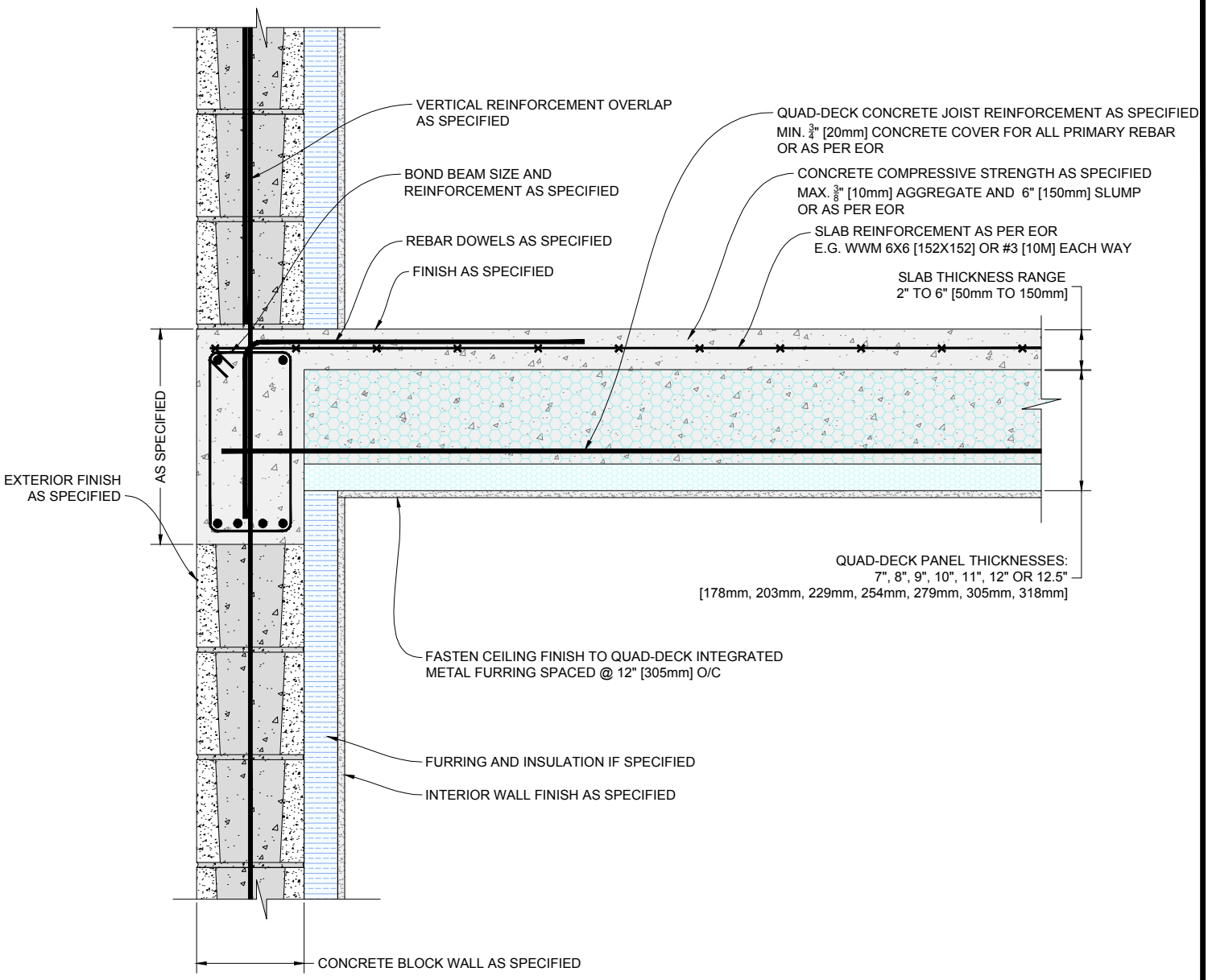
QUAD-DECK PANELS PARALLEL TO CONCRETE BLOCK WALL

DATE DRAWN:	2015-08-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-613



1 QUAD-DECK PANELS PERPENDICULAR TO CONCRETE BLOCK WALL

Scale: N.T.S.

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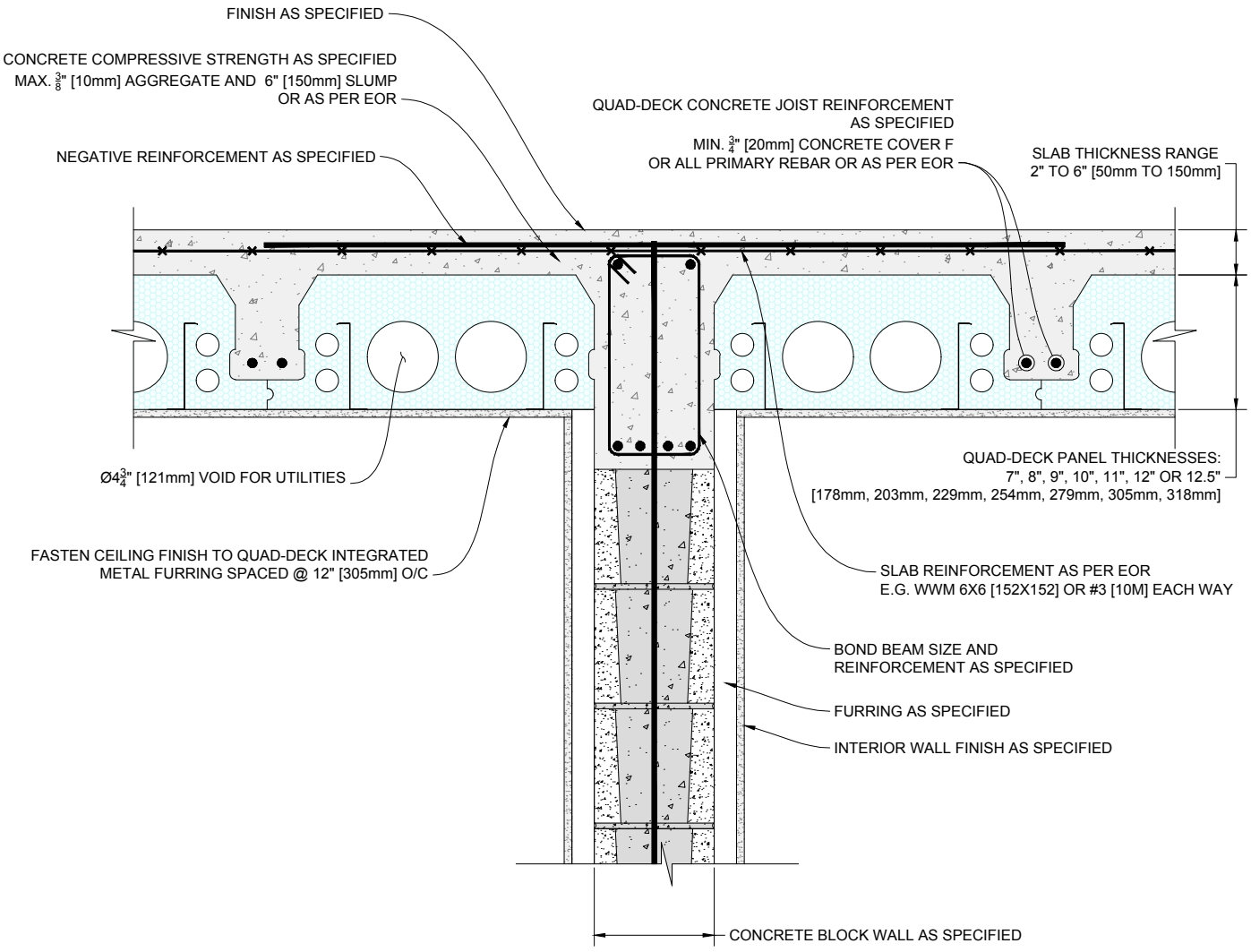
QUAD-DECK PANELS PERPENDICULAR TO CONCRETE BLOCK WALL

DATE DRAWN:	2015-08-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-614



1 QUAD-DECK PANELS PARALLEL TO TOP OF INTERMEDIATE CONCRETE BLOCK WALL

Scale: N.T.S.

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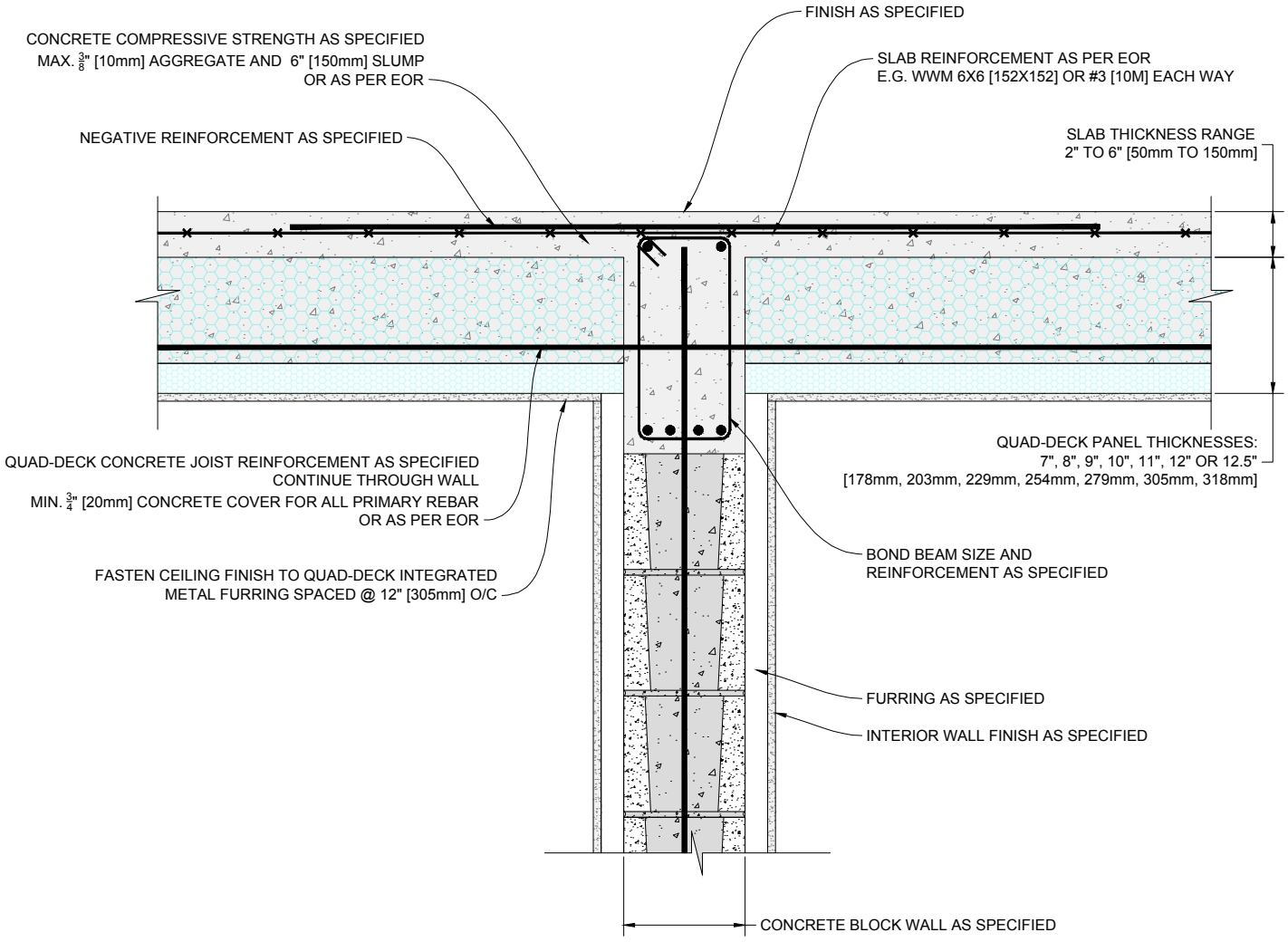
QUAD-DECK PANELS PARALLEL TO TOP OF INTERMEDIATE CONCRETE BLOCK WALL

DATE DRAWN: 2015-08-15		COMMENTS: N/A	
REVISION NO: YYYY-MM-DD		SHEET SIZE: 8.5" x 11" [216mm x 279mm]	
REVISION DATE: N/A		SCALE: NOT TO SCALE	DRAWING NO: QD-615
DRAWN BY: Z. PROSTRAN		APPROVED BY: G. KUSTERMANN	



1 QUAD-DECK PANELS PERPENDICULAR TO TOP OF INTERMEDIATE CONCRETE BLOCK WALL

Scale: N.T.S.

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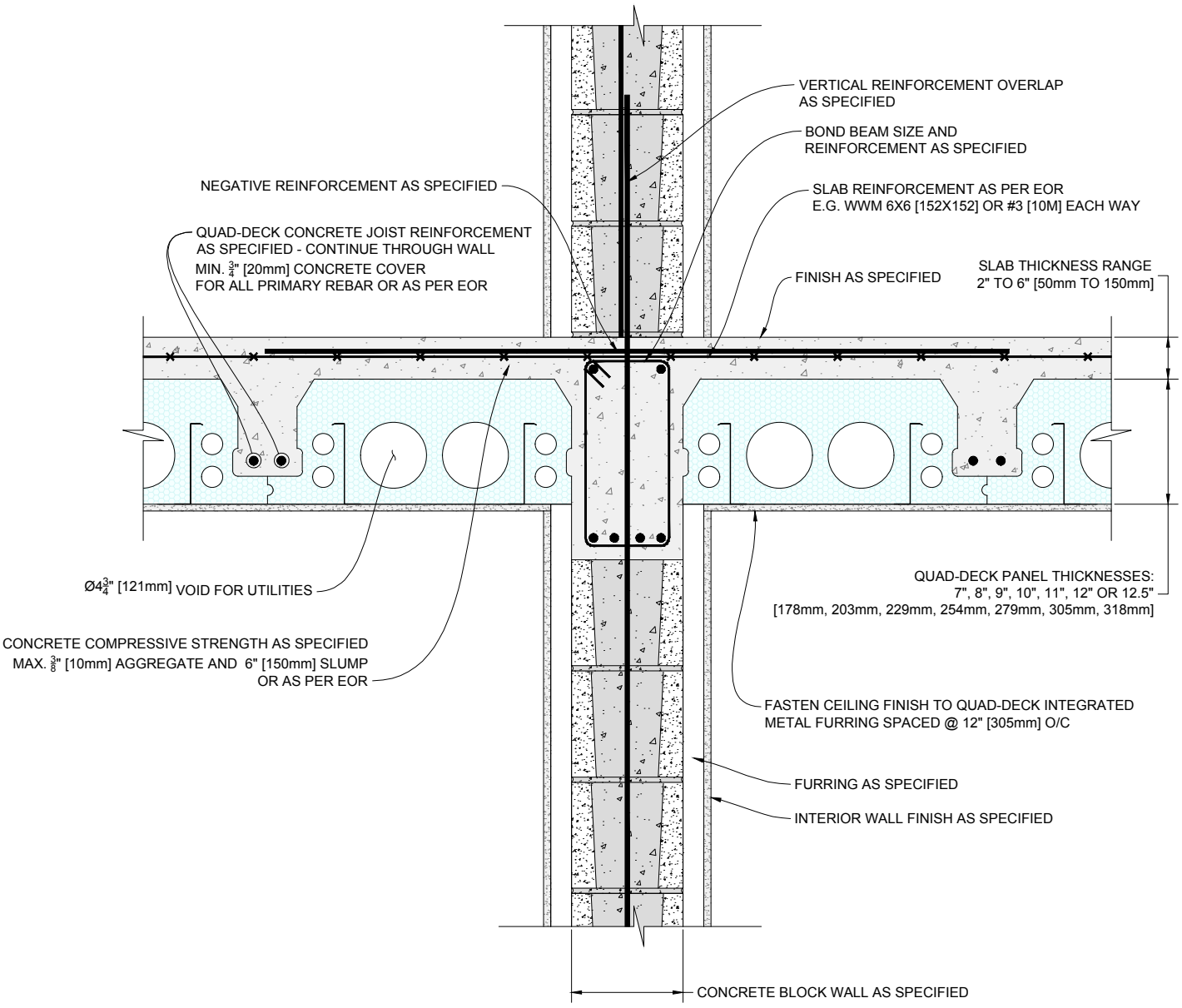
QUAD-DECK PANELS PERPENDICULAR TO TOP OF INTERMEDIATE CONCRETE BLOCK WALL

DATE DRAWN: 2015-08-15		COMMENTS: N/A	
REVISION NO: YYYY-MM-DD		SHEET SIZE: 8.5" x 11" [216mm x 279mm]	
REVISION DATE: N/A		SCALE: NOT TO SCALE	DRAWING NO: QD-616
DRAWN BY: Z. PROSTRAN		APPROVED BY: G. KUSTERMANN	



1 QUAD-DECK PANELS PARALLEL TO INTERMEDIATE CONCRETE BLOCK WALL

Scale: N.T.S.

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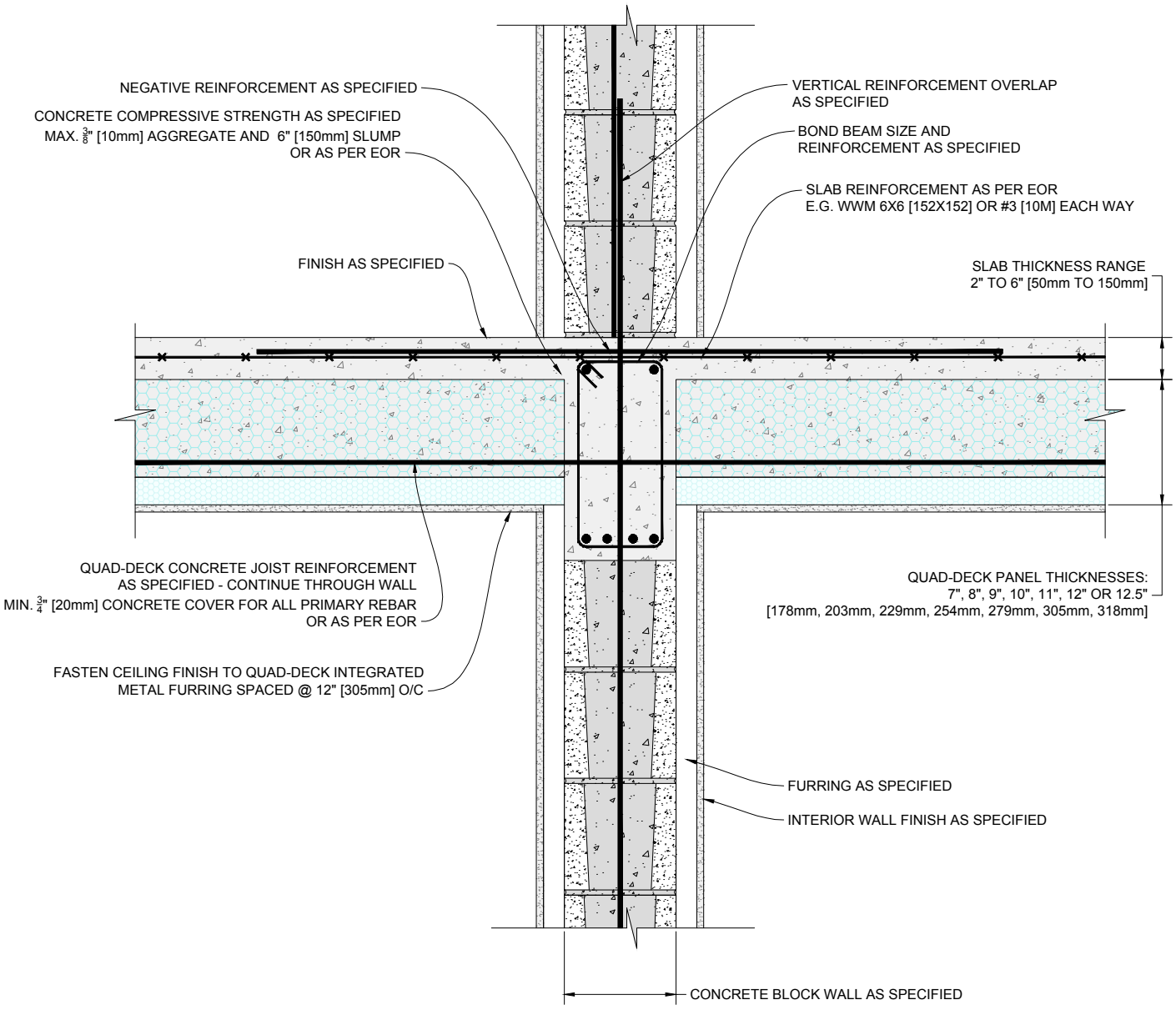
QUAD-DECK PANELS PARALLEL TO INTERMEDIATE CONCRETE BLOCK WALL

DATE DRAWN:	2015-08-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-617



1 QUAD-DECK PANELS PERPENDICULAR TO INTERMEDIATE CONCRETE BLOCK WALL

Scale: N.T.S.

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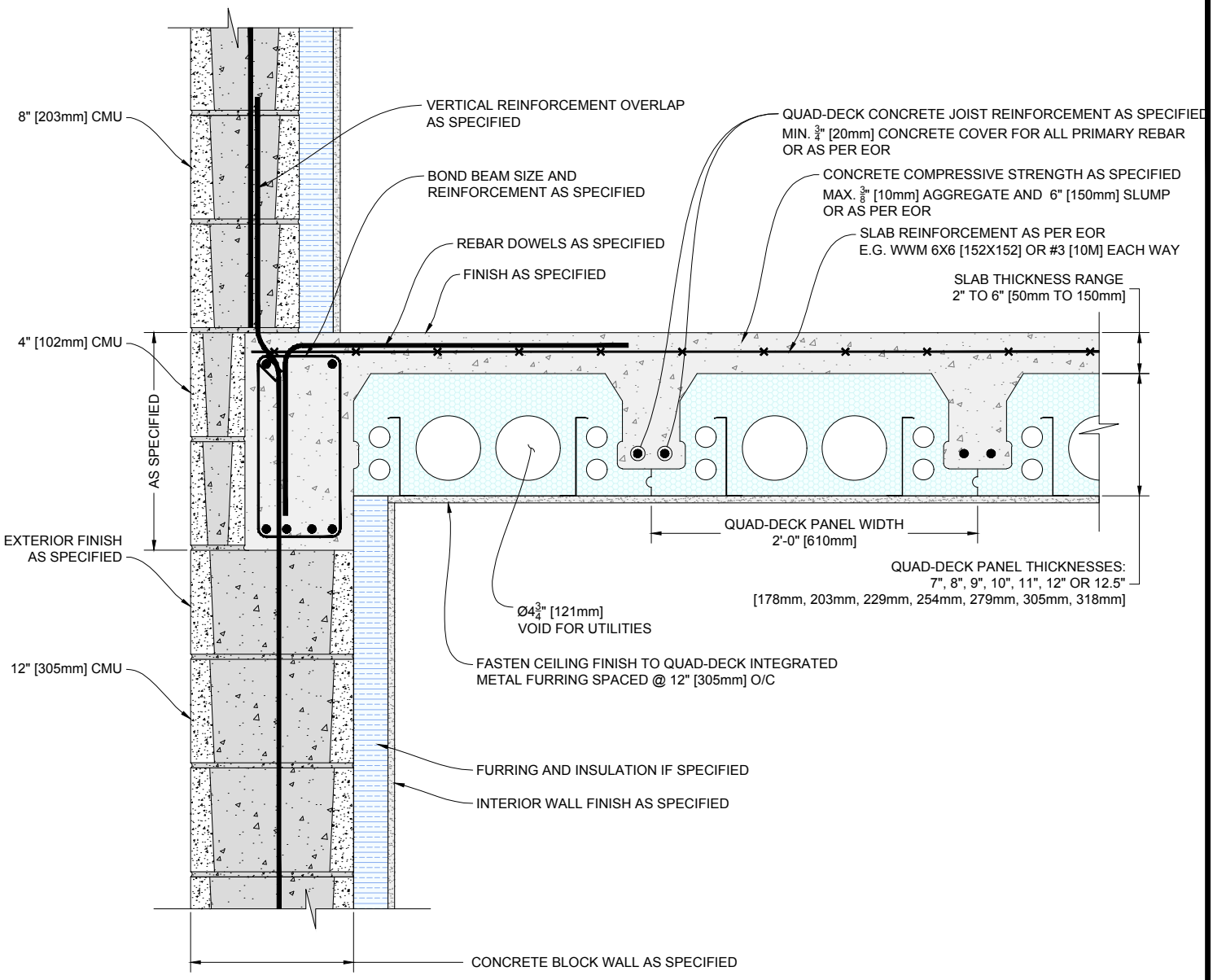
QUAD-DECK PANELS PERPENDICULAR TO INTERMEDIATE CONCRETE BLOCK WALL

DATE DRAWN:	2015-08-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-618



1 QUAD-DECK PANELS PARALLEL TO TRANSITIONING CONCRETE BLOCK WALL

Scale: N.T.S.

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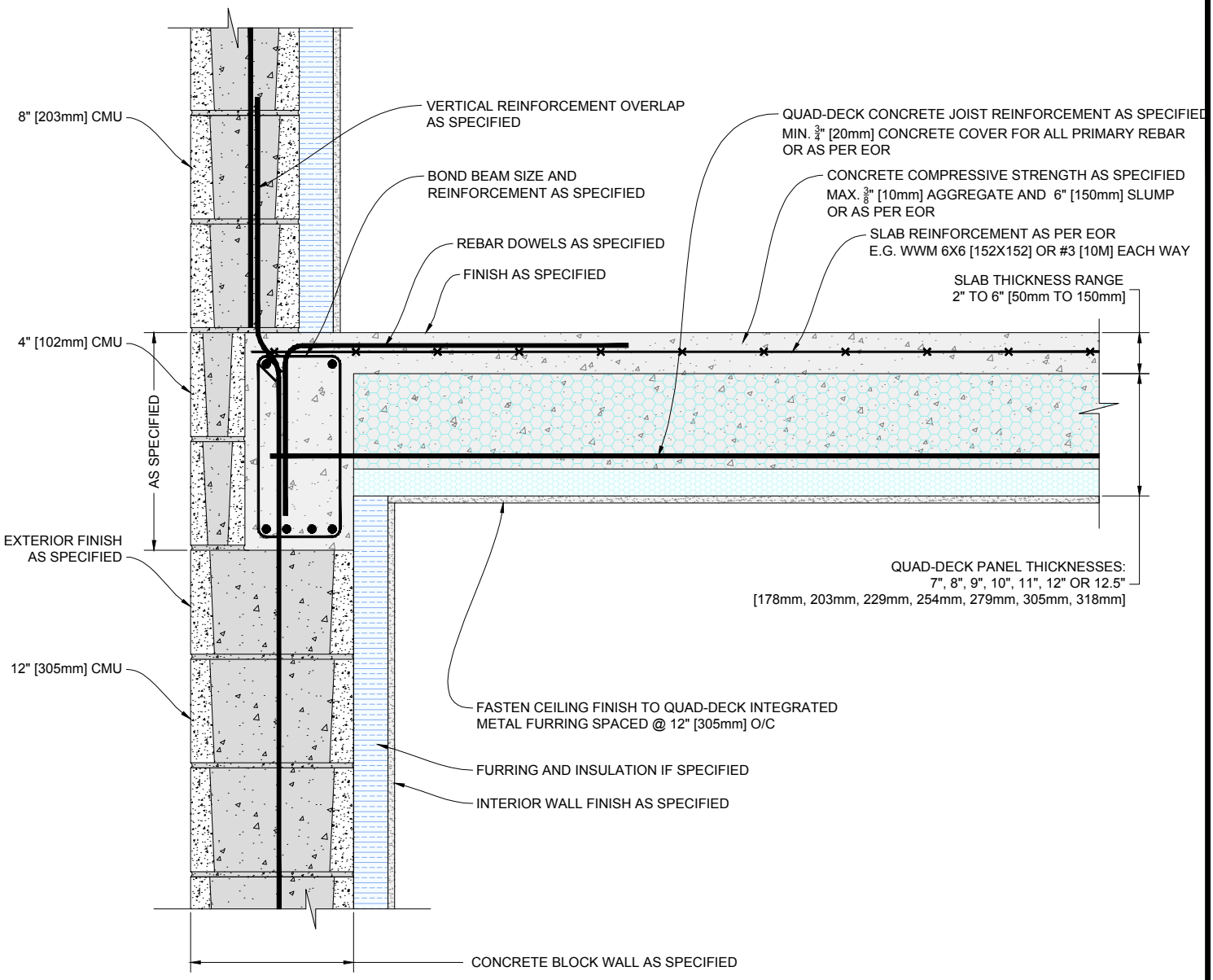
QUAD-DECK PANELS PARALLEL TO TRANSITIONING CONCRETE BLOCK WALL

DATE DRAWN: 2015-08-15		COMMENTS: N/A	
REVISION NO: YYYY-MM-DD		SHEET SIZE: 8.5" x 11" [216mm x 279mm]	
REVISION DATE: N/A		SCALE: NOT TO SCALE	DRAWING NO: QD-619
DRAWN BY: Z. PROSTRAN		APPROVED BY: G. KUSTERMANN	



1 QUAD-DECK PANELS PERPENDICULAR TO TRANSITIONING CONCRETE BLOCK WALL

Scale: N.T.S.

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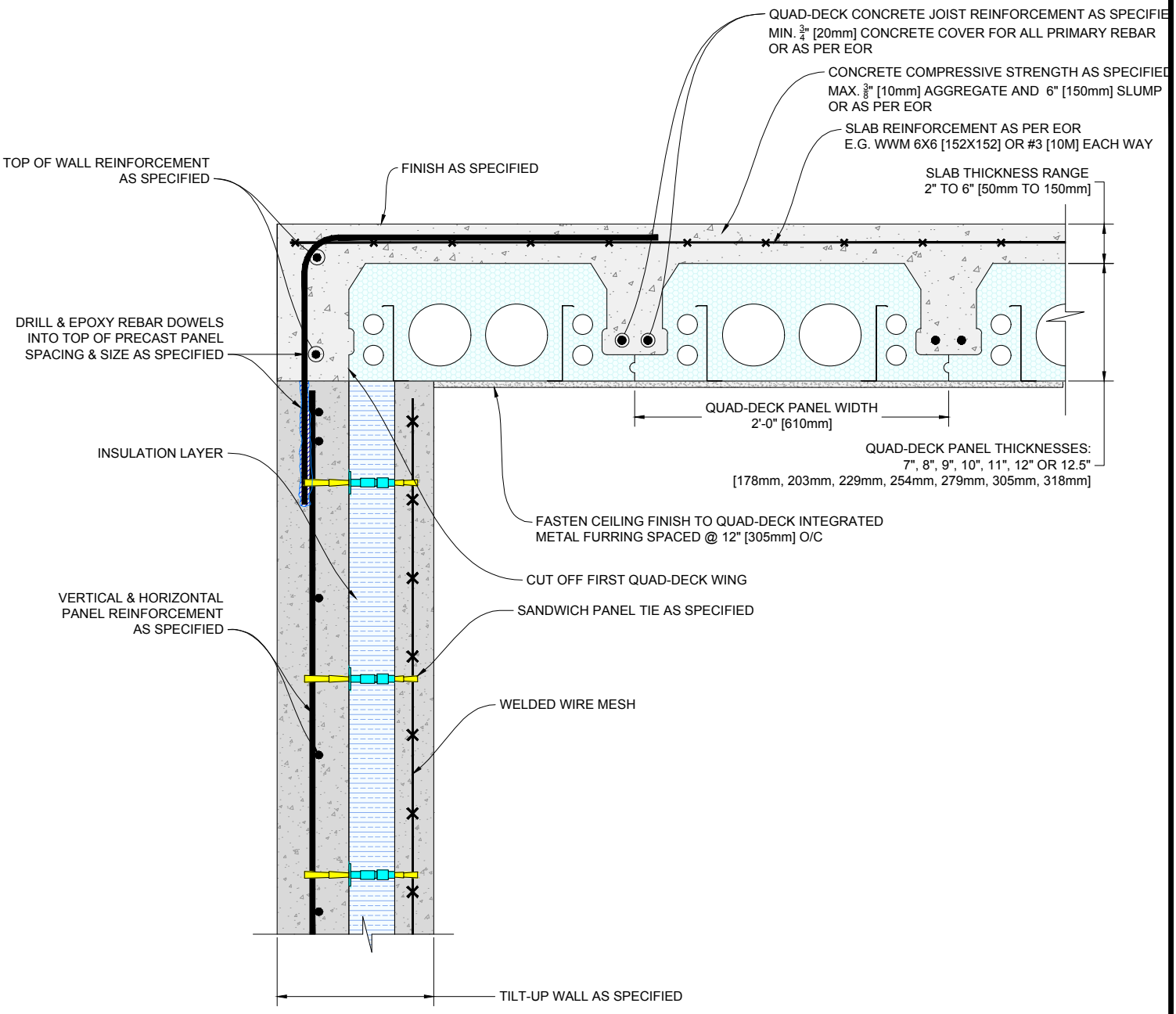
QUAD-DECK PANELS PERPENDICULAR TO TRANSITIONING CONCRETE BLOCK WALL

DATE DRAWN:	2015-08-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-620



1 QUAD-DECK PANELS PARALLEL TO TOP OF TILT-UP WALL

Scale: N.T.S.

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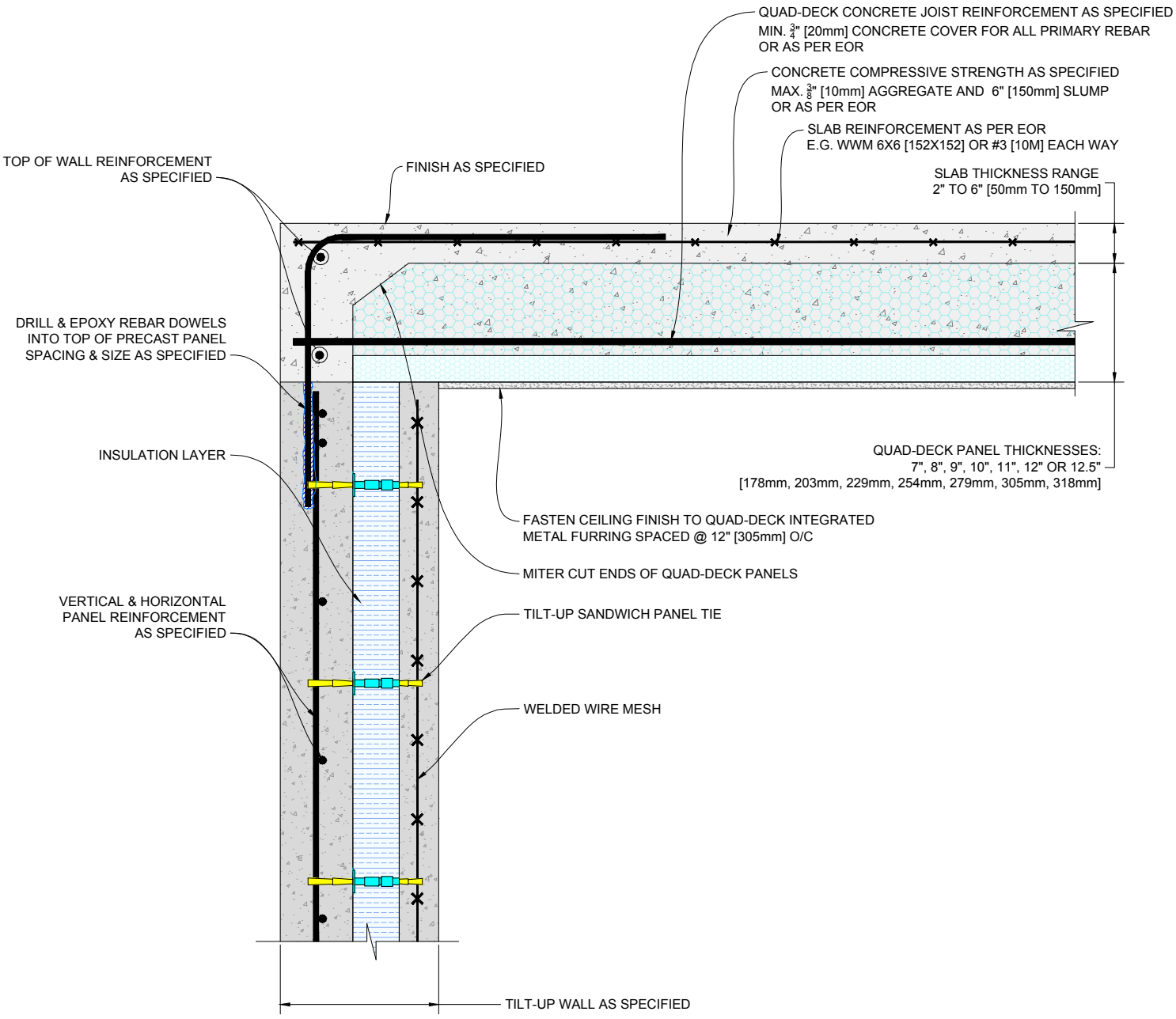
QUAD-DECK PANELS PARALLEL TO TOP OF TILT-UP WALL

DATE DRAWN:	2015-08-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-621



1 QUAD-DECK PANELS PERPENDICULAR TO TOP OF TILT-UP WALL

Scale: N.T.S.

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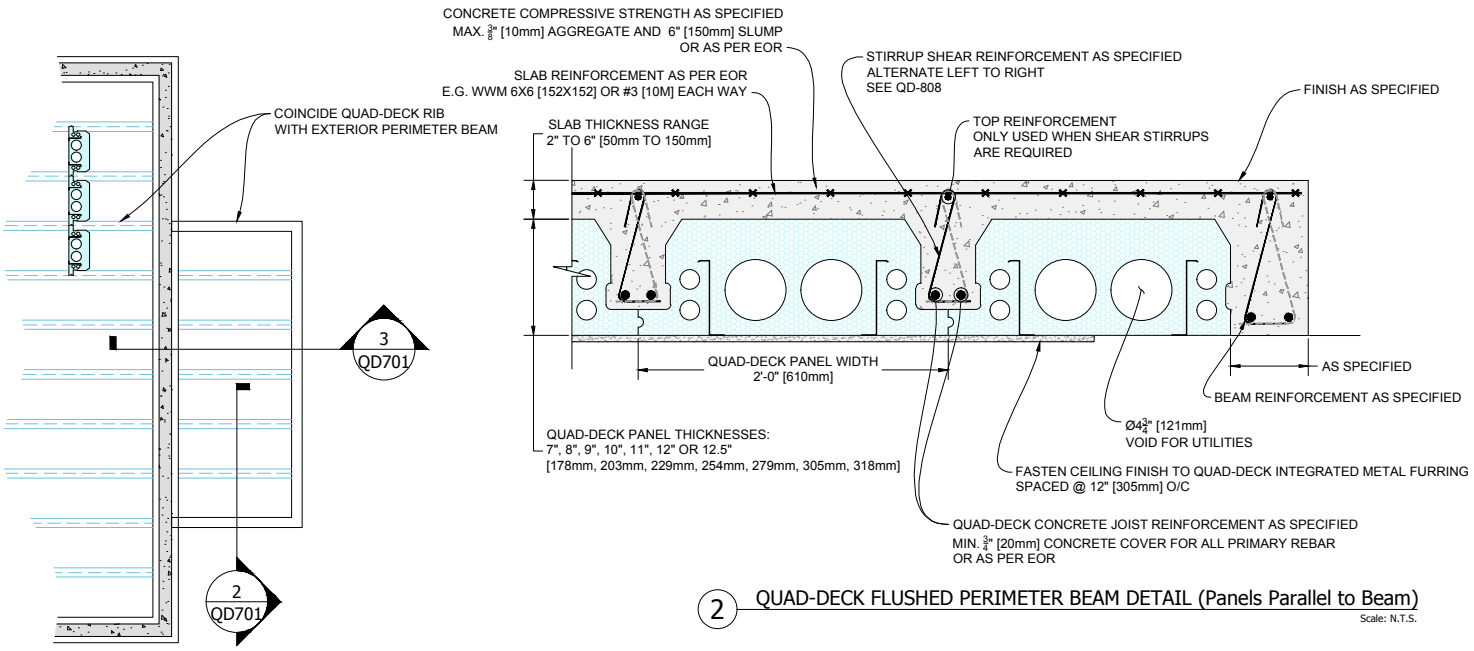
QUAD-DECK PANELS PERPENDICULAR TO TOP OF TILT-UP WALL

DATE DRAWN:	2015-08-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-622

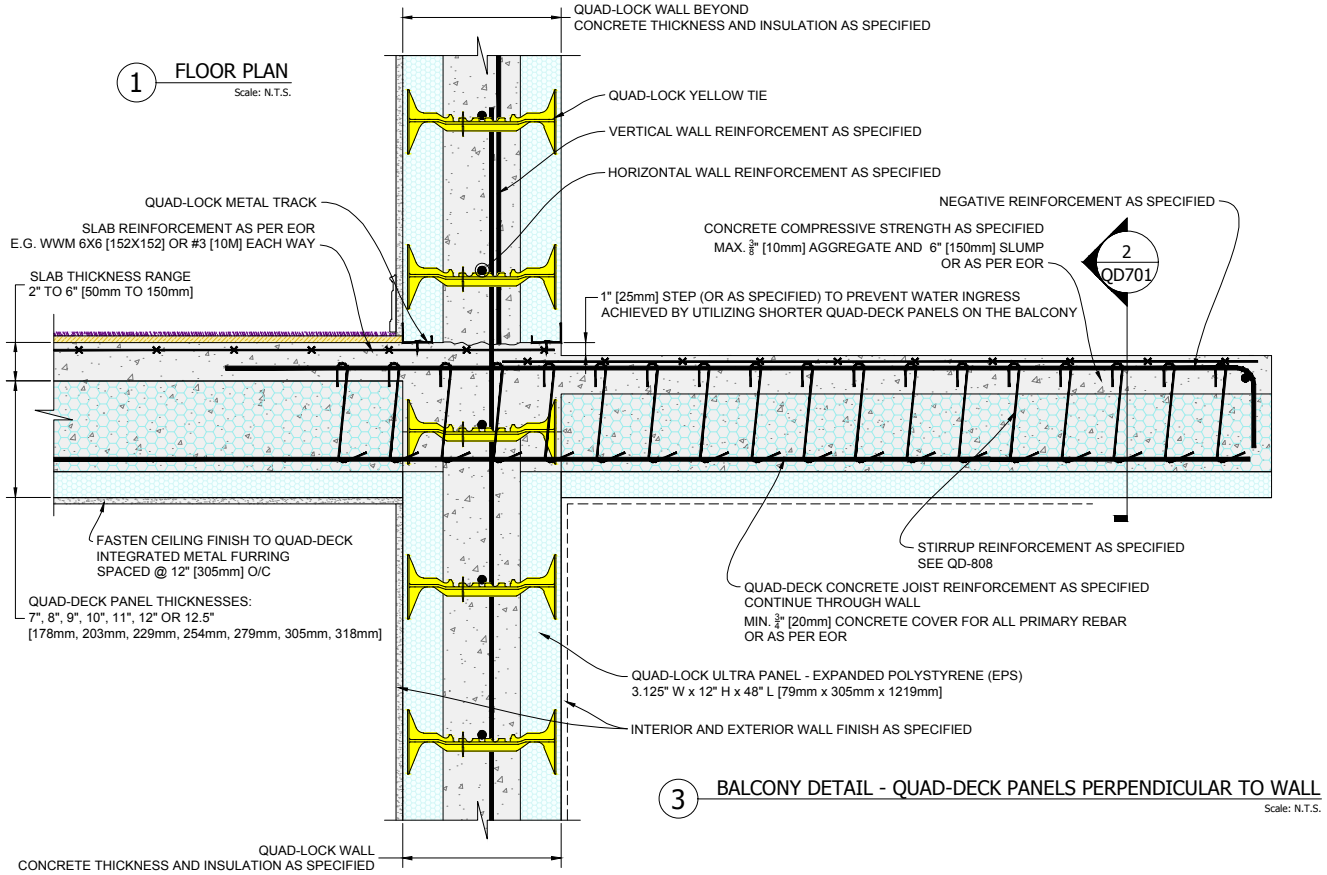


2 QUAD-DECK FLUSHED PERIMETER BEAM DETAIL (Panels Parallel to Beam)

Scale: N.T.S.

1 FLOOR PLAN

Scale: N.T.S.



3 BALCONY DETAIL - QUAD-DECK PANELS PERPENDICULAR TO WALL

Scale: N.T.S.

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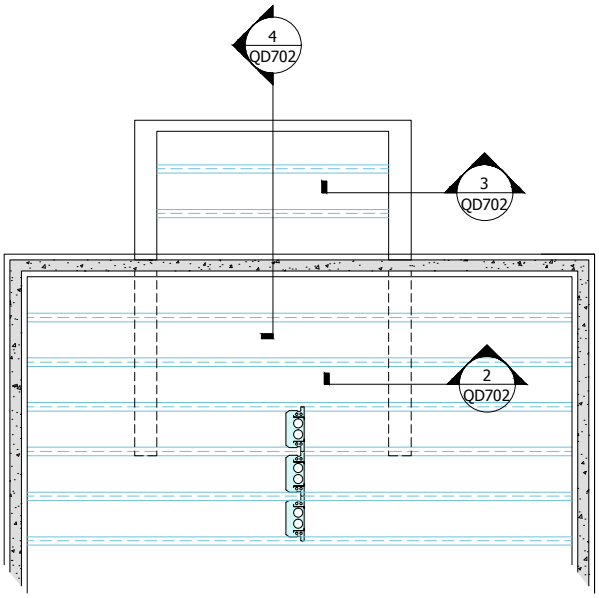
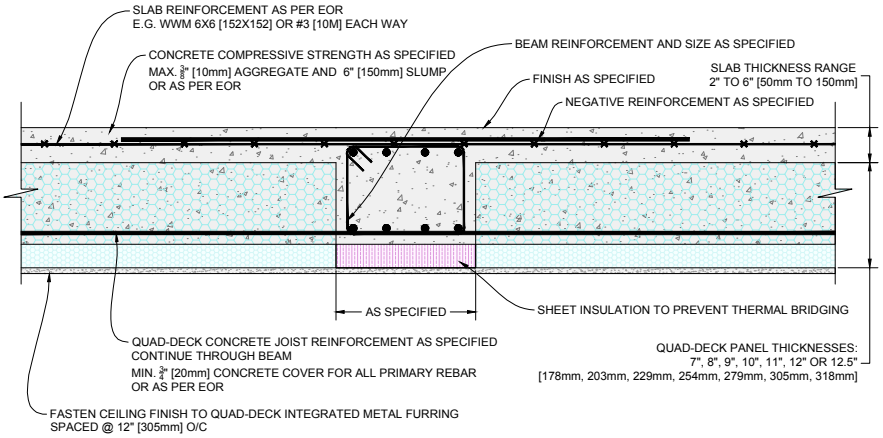
BALCONY CANTILEVER: QUAD-DECK PERPENDICULAR TO WALL

DATE DRAWN:	2015-08-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

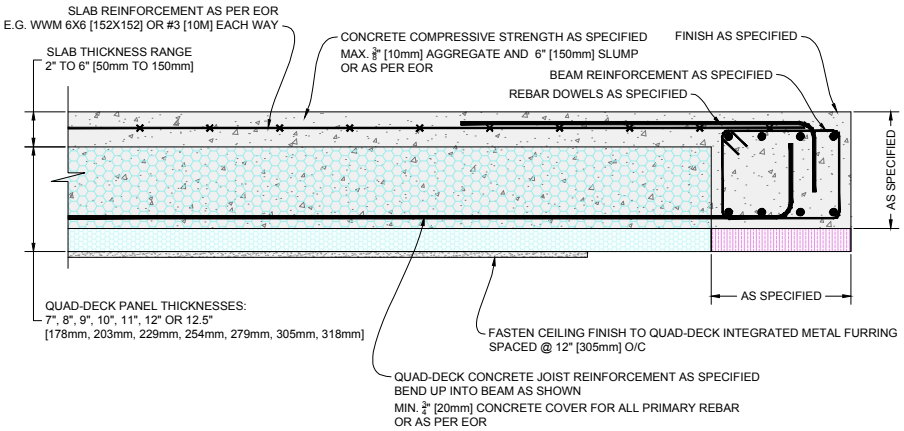
DRAWING NO: QD-701



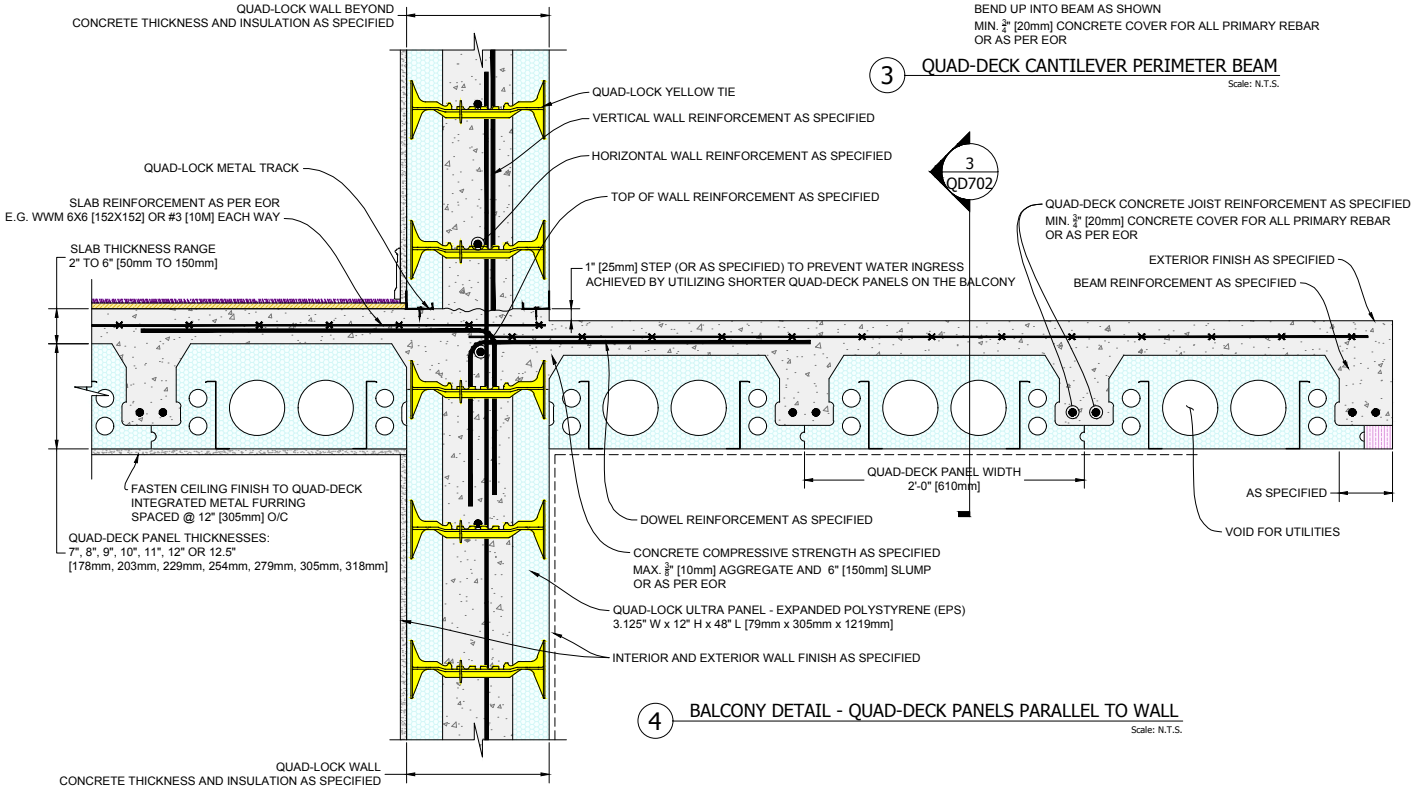
1 FLOOR PLAN
Scale: N.T.S.



2 CANTILEVER COUNTERBALANCE BEAM
Scale: N.T.S.



3 QUAD-DECK CANTILEVER PERIMETER BEAM
Scale: N.T.S.



4 BALCONY DETAIL - QUAD-DECK PANELS PARALLEL TO WALL
Scale: N.T.S.

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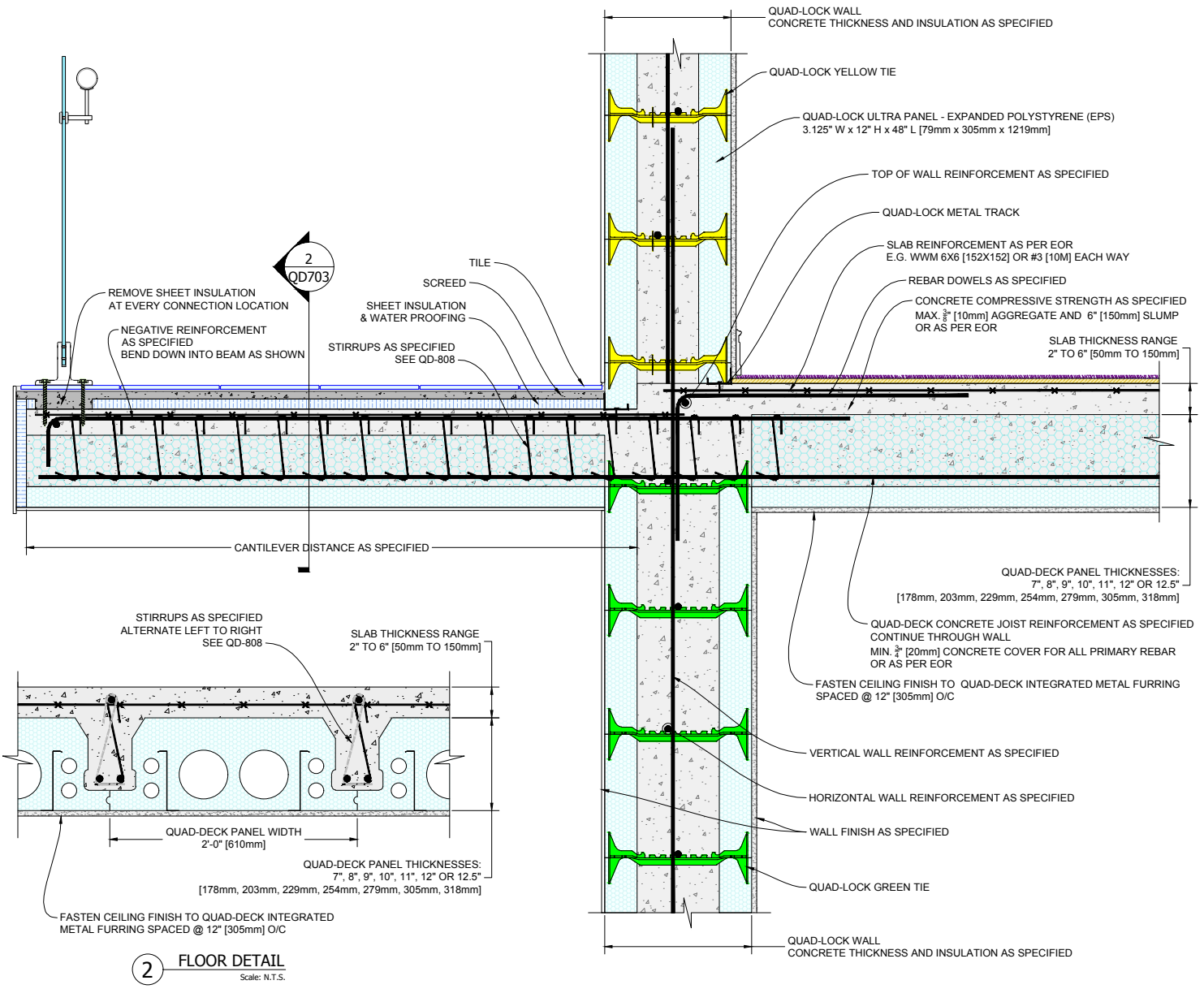
BALCONY CANTILEVER: QUAD-DECK PARALLEL TO WALL

DATE DRAWN:	2015-08-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-702



2 FLOOR DETAIL
Scale: N.T.S.

1 INSULTED BALCONY DETAIL - QUAD-DECK PANELS PERPENDICULAR TO WALL
Scale: N.T.S.

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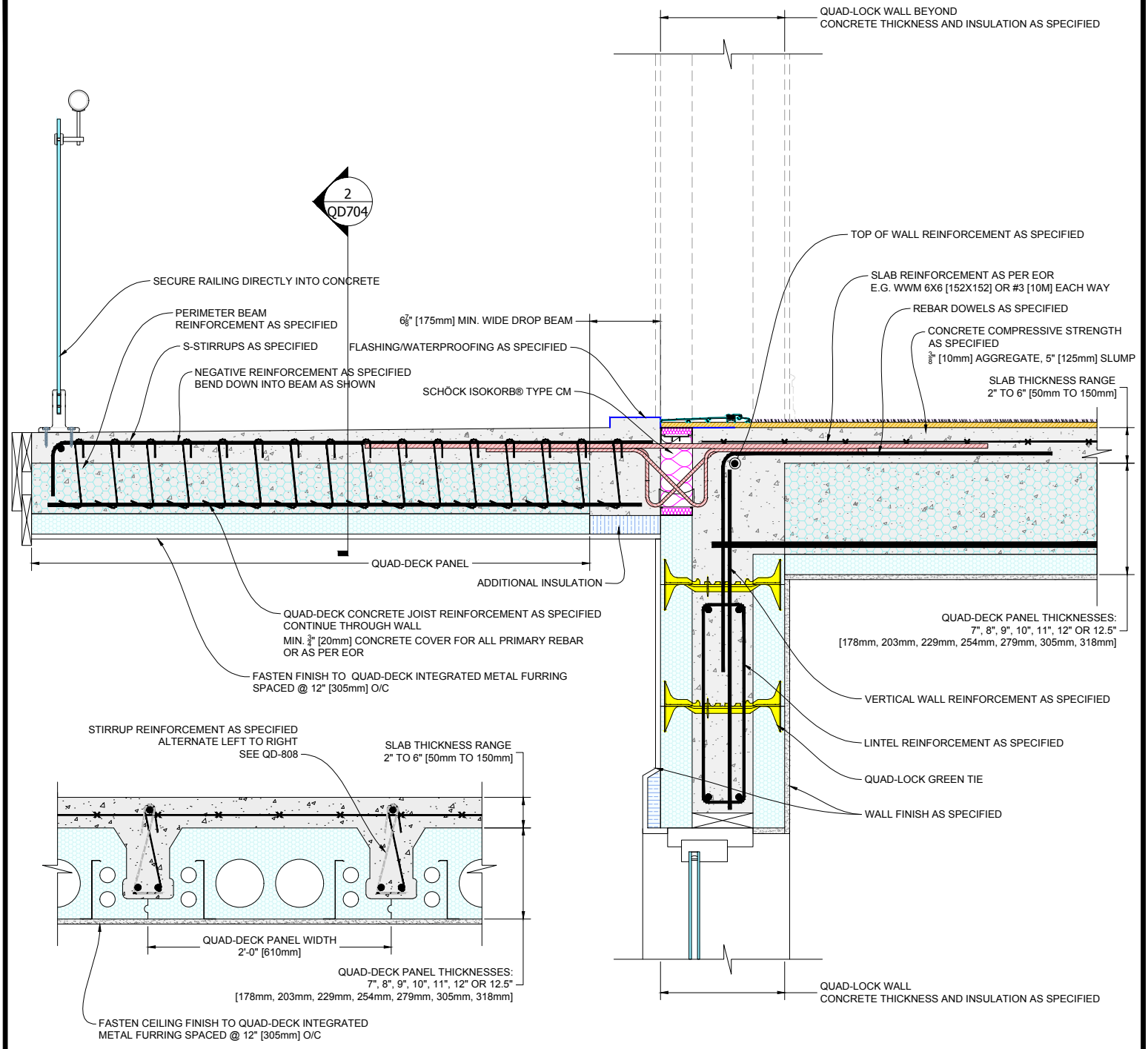
INSULATED BALCONY - QUAD-DECK PANELS PERPENDICULAR TO WALL

DATE DRAWN:	2015-08-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-703



2 FLOOR DETAIL
Scale: N.T.S.

1 BALCONY DETAIL WITH ISOKORB - QUAD-DECK PANELS PERPENDICULAR TO WALL
Scale: N.T.S.

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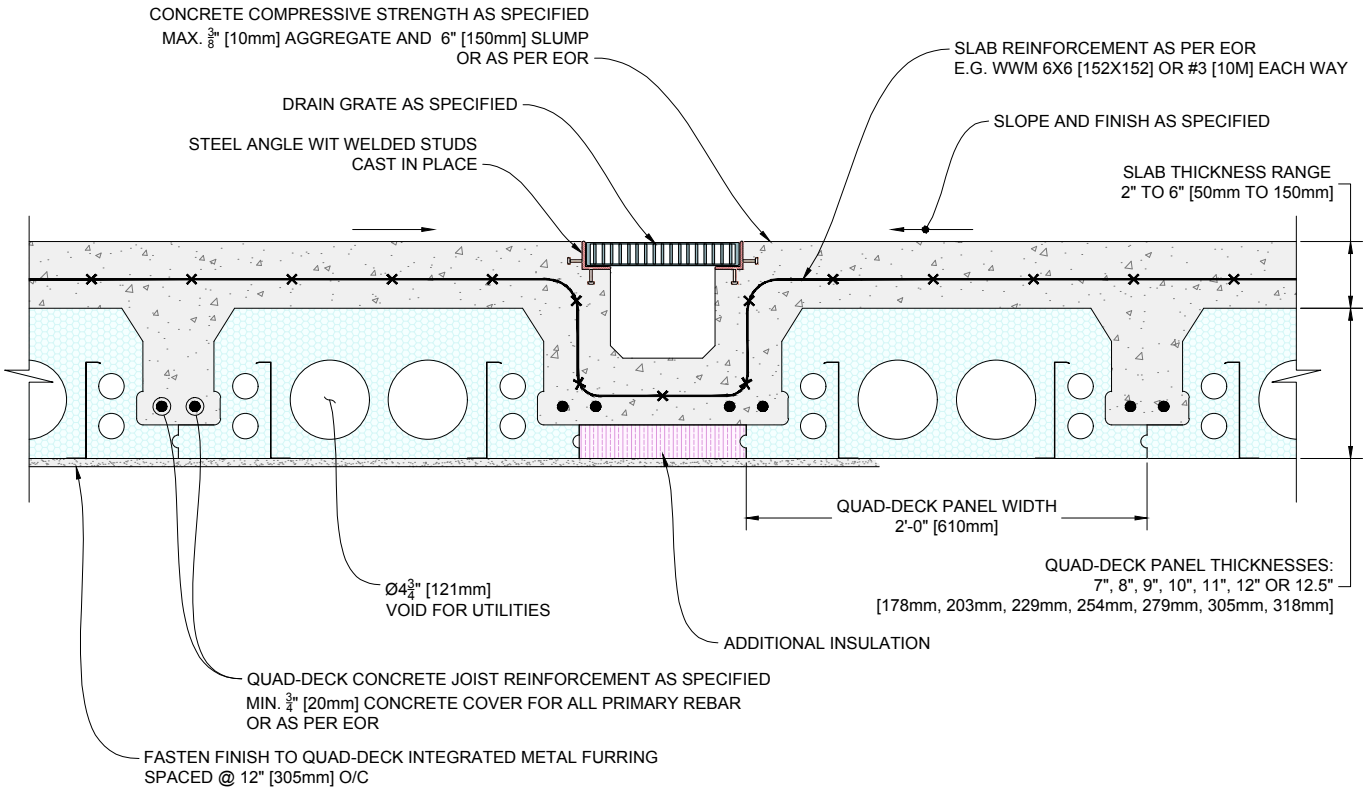
QUAD-DECK BALCONY DETAIL: With Schöck Isokorb® Type CM

DATE DRAWN:	2015-08-15	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-704



1 QUAD-DECK FLOOR DRAIN

Scale: N.T.S.

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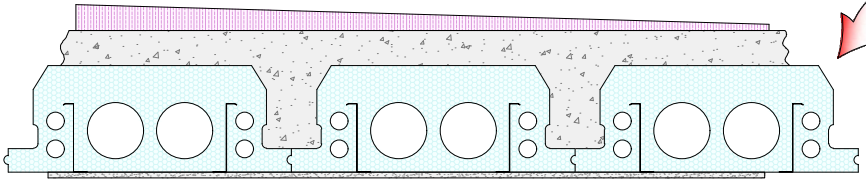
QUAD-DECK TRENCH DRAIN DETAIL

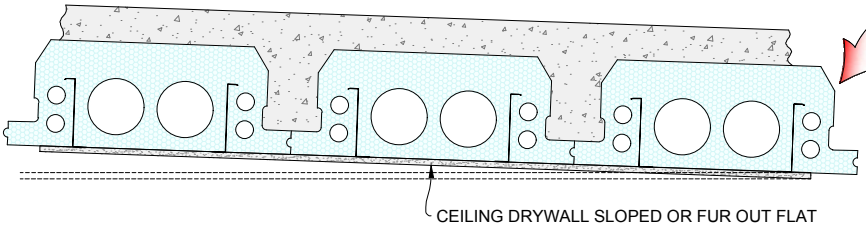
DATE DRAWN:	2015-08-25	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-801



Great for roofs (with valleys)
- inexpensive & fast
- thermal optimization

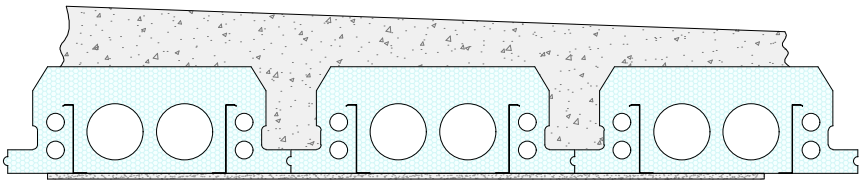
A — QUAD-DECK DRAINAGE SLOPE
SLOPE BY ADDING SHEET INSULATION ON TOP



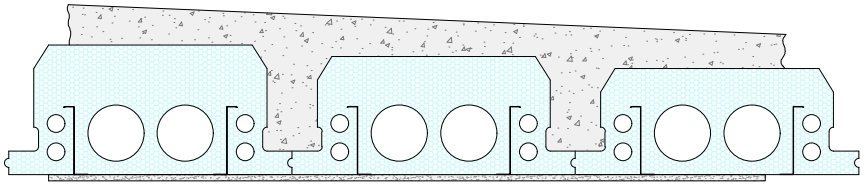
Great for garage floors

B — QUAD-DECK DRAINAGE SLOPE
SLOPE ENTIRE FLOOR/ROOF ASSEMBLY - FUR OUT THE UNDERSIDE

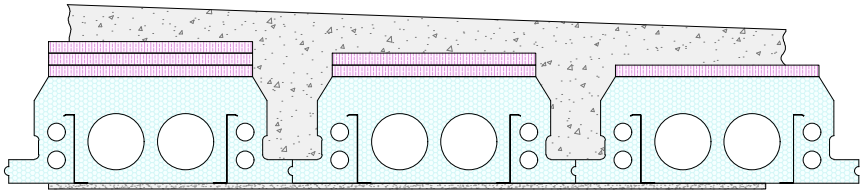
CEILING DRYWALL SLOPED OR FUR OUT FLAT



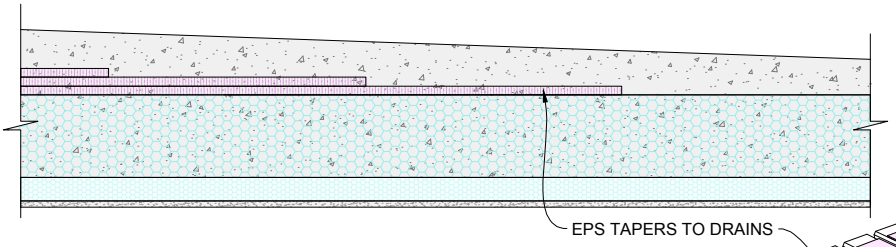
C — QUAD-DECK DRAINAGE SLOPE
SLOPE THE SLAB THICKNESS



D — QUAD-DECK DRAINAGE SLOPE
USE VARYING QUAD-DECK PANEL THICKNESSES

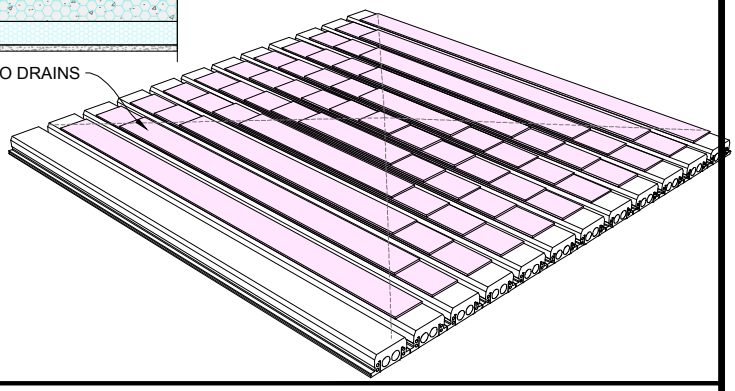


E — QUAD-DECK DRAINAGE SLOPE
PLACE EPS SHEETS ON TOP OF EACH PANEL
USED WITH ONE WAY SLOPES



EPS TAPERS TO DRAINS

F — QUAD-DECK DRAINAGE SLOPE
SAME AS OPTION 'D' ABOVE - SLOPE USING EPS SHEETS



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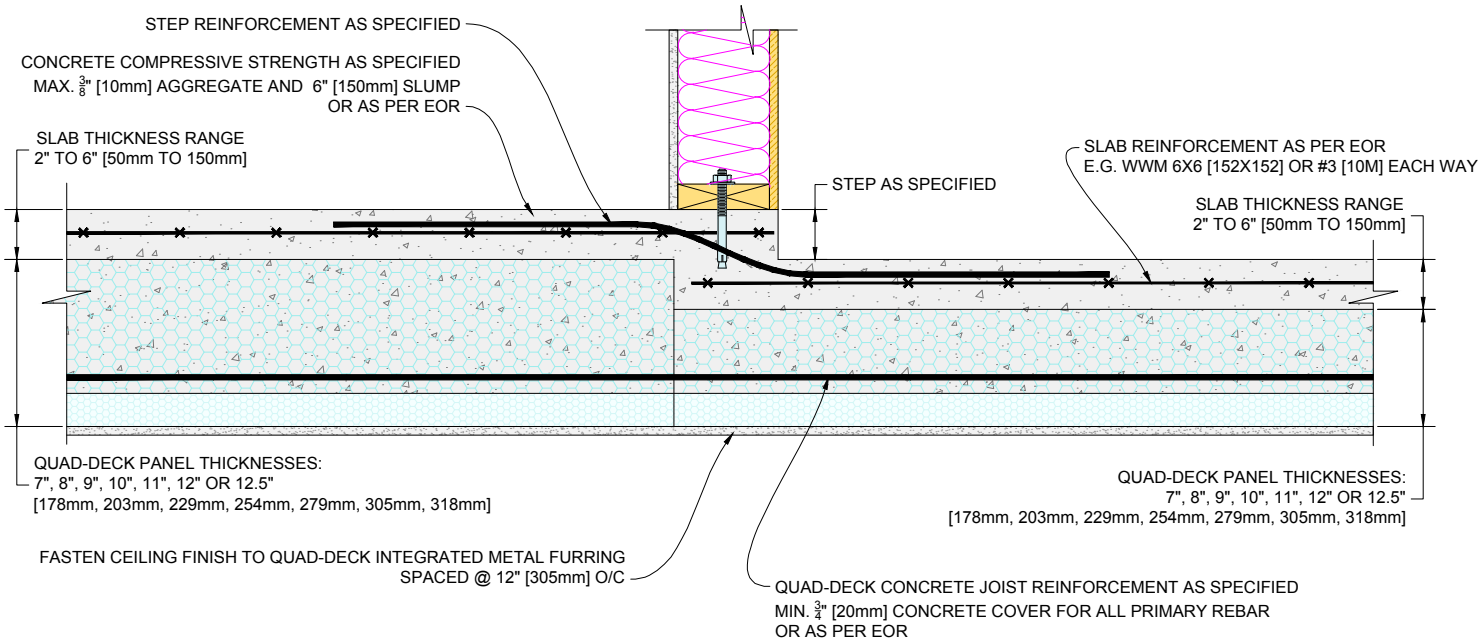
QUAD-DECK SLOPE OPTIONS FOR DRAINAGE

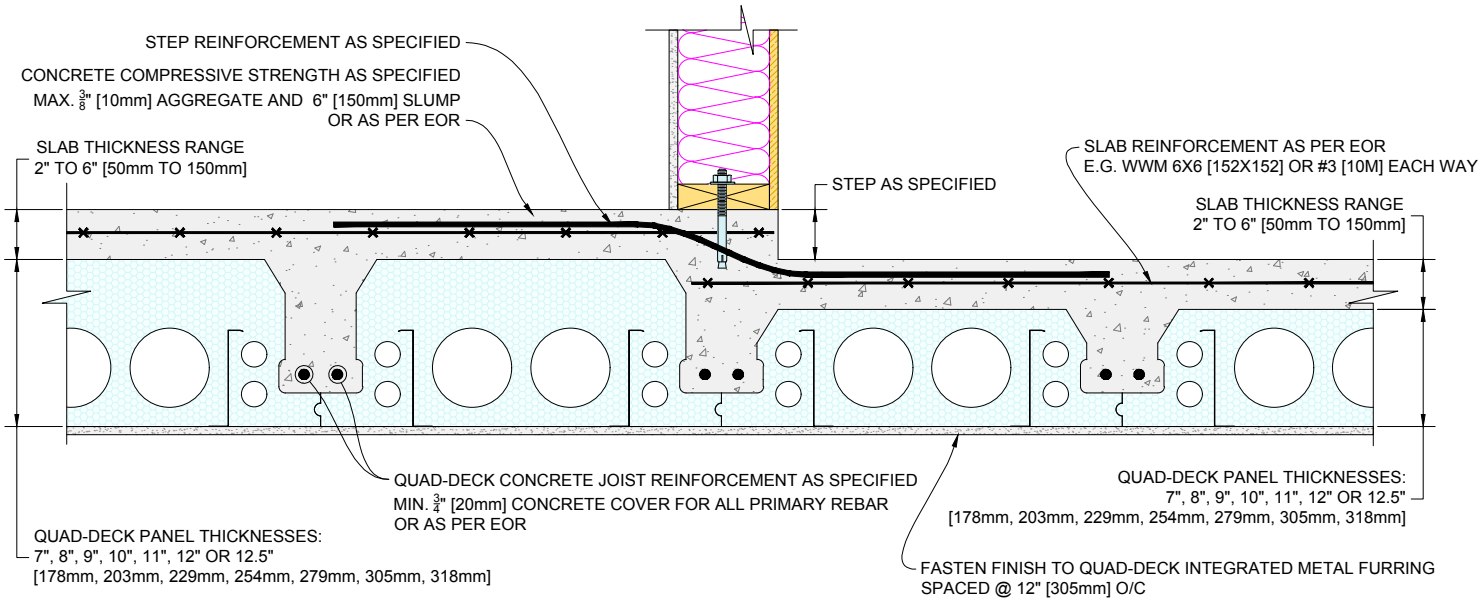
DATE DRAWN:	2015-05-25	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-802



1 FLOOR STEP PERPENDICULAR TO QUAD-DECK WITH SMALLER QUAD-DECK PANELS

Scale: N.T.S.



1 FLOOR STEP PARALLEL TO QUAD-DECK WITH SMALLER QUAD-DECK PANELS

Scale: N.T.S.

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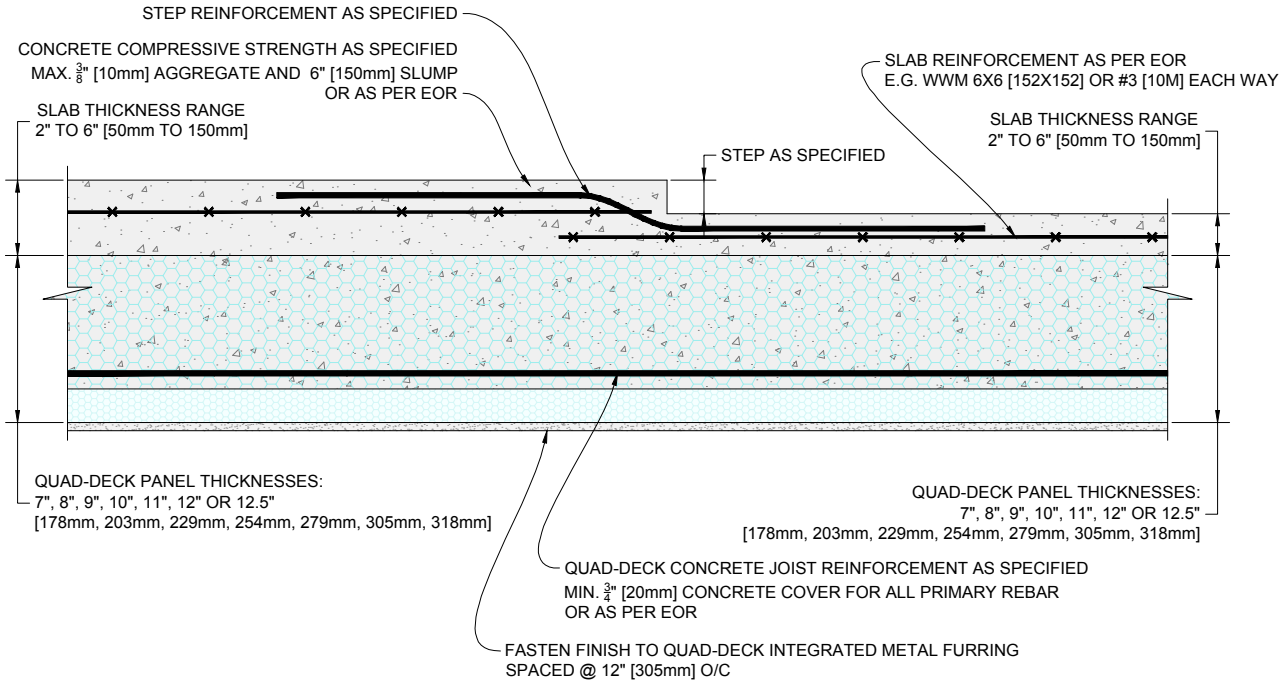
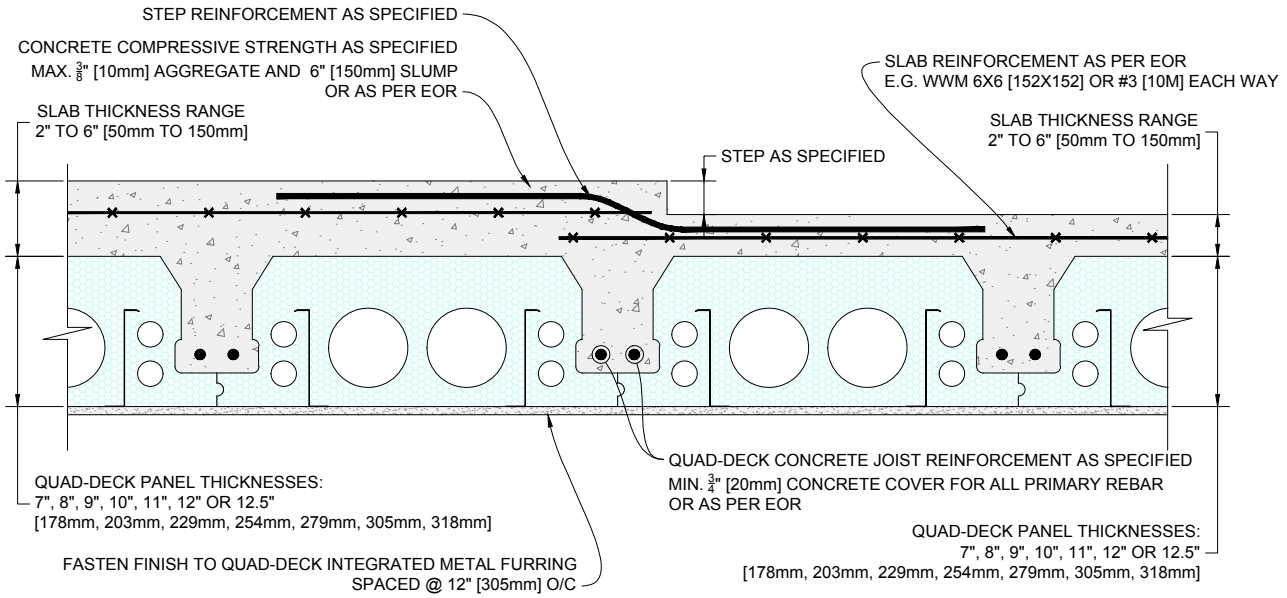
QUAD-DECK FLOOR STEP WITH SMALLER PANELS

DATE DRAWN: 2015-05-25		COMMENTS: N/A	
REVISION NO: YYYY-MM-DD		SHEET SIZE: 8.5" x 11" [216mm x 279mm]	
REVISION DATE: N/A		SCALE: NOT TO SCALE	DRAWING NO: QD-803
DRAWN BY: Z. PROSTRAN		APPROVED BY: G. KUSTERMANN	



1 FLOOR STEP PERPENDICULAR TO QUAD-DECK WITH SMALLER SLAB THICKNESS

Scale: N.T.S.



1 FLOOR STEP PARALLEL TO QUAD-DECK WITH SMALLER SLAB THICKNESS

Scale: N.T.S.

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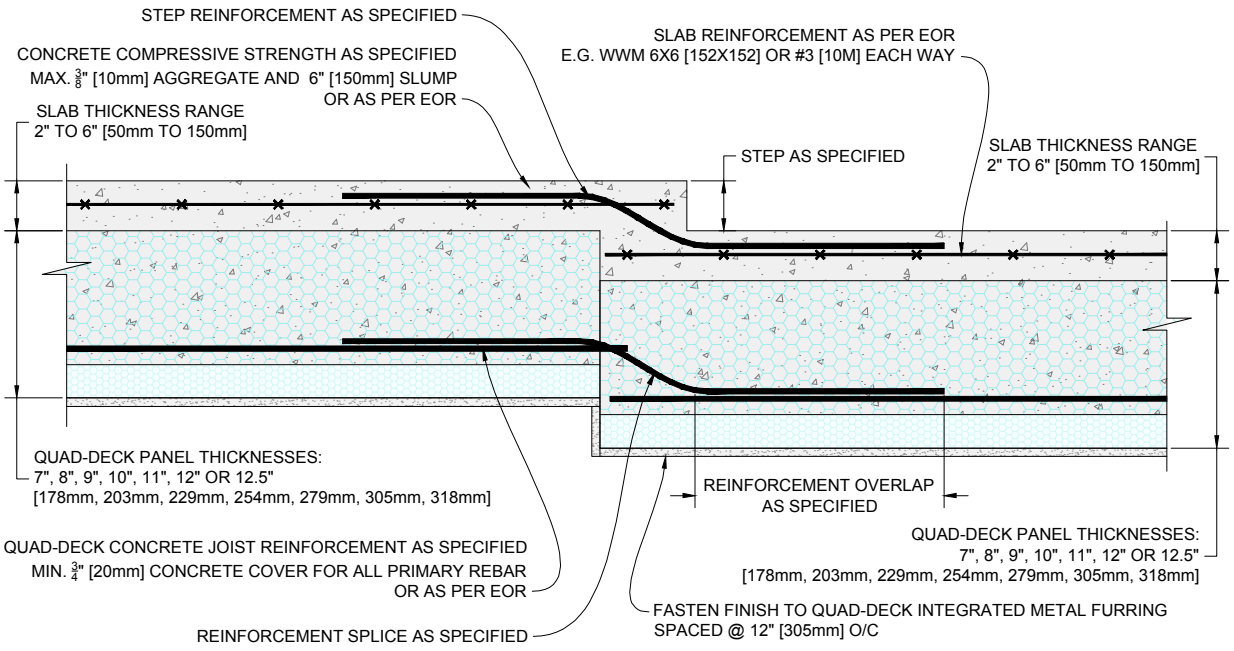
QUAD-DECK FLOOR STEP WITH SMALLER SLAB

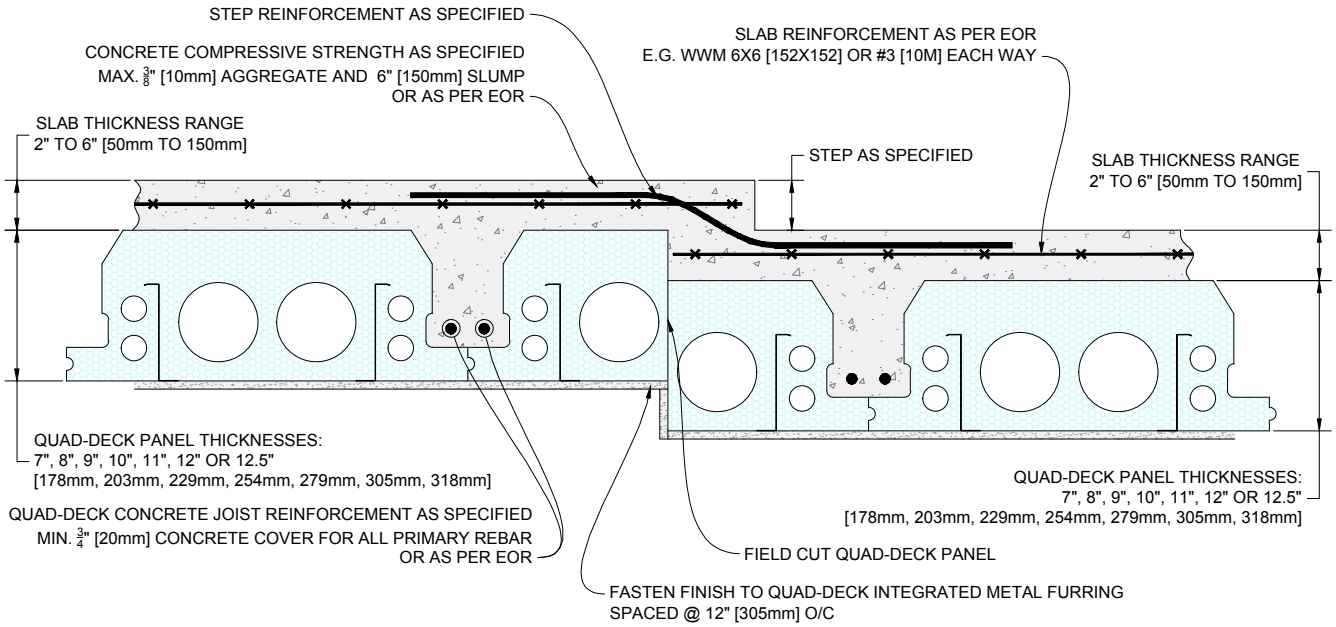
DATE DRAWN:	2015-05-25	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-804



1 FLOOR STEP PERPENDICULAR TO QUAD-DECK WITH DROPPED PANELS

Scale: N.T.S.



1 FLOOR STEP PARALLEL TO QUAD-DECK WITH DROPPED PANELS

Scale: N.T.S.

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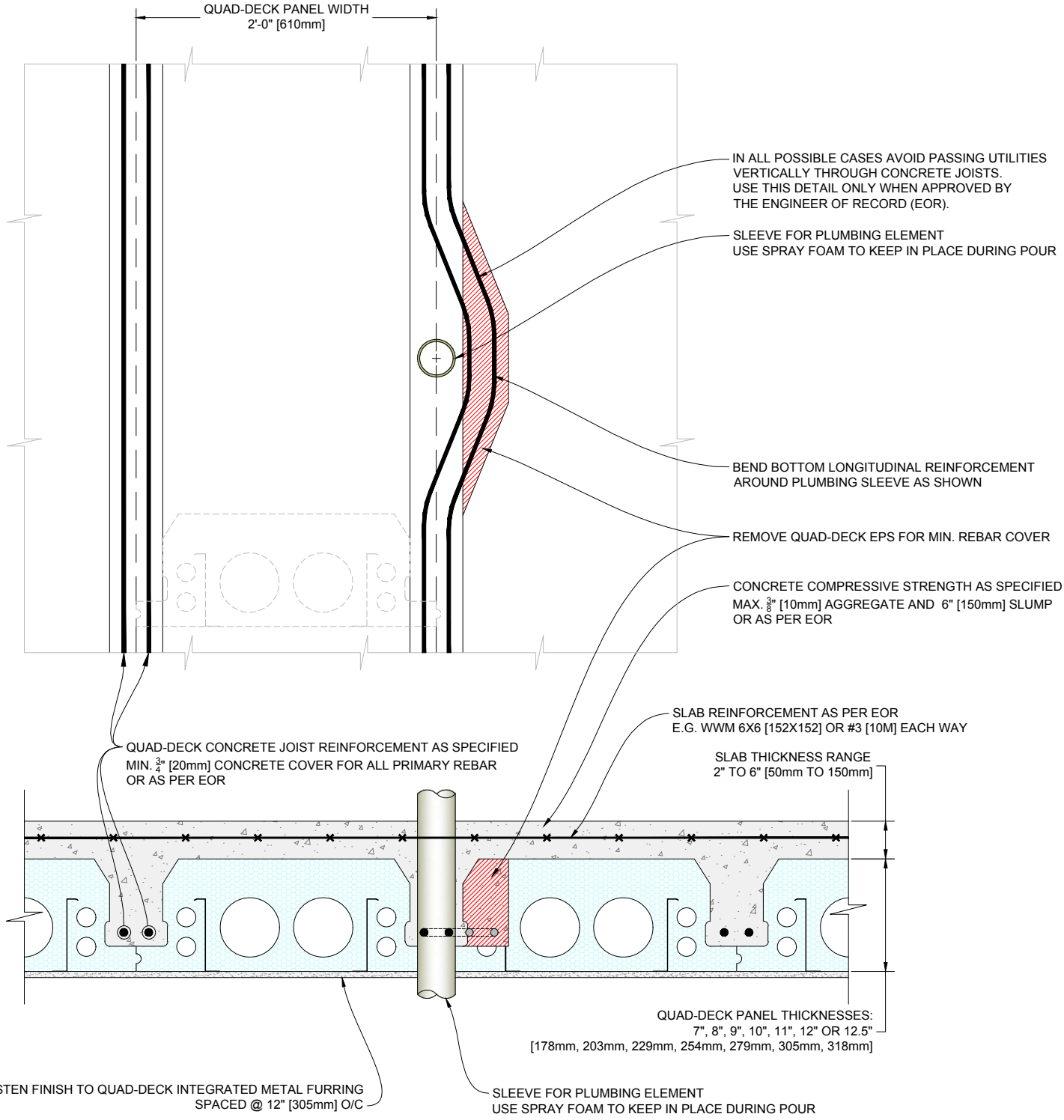
QUAD-DECK FLOOR STEP WITH DROPPED PANELS

DATE DRAWN: 2015-08-25		COMMENTS: N/A	
REVISION NO: YYYY-MM-DD		SHEET SIZE: 8.5" x 11" [216mm x 279mm]	
REVISION DATE: N/A		SCALE: NOT TO SCALE	DRAWING NO: QD-805
DRAWN BY: Z. PROSTRAN		APPROVED BY: G. KUSTERMANN	



1 QUAD-DECK CONCRETE JOIST BYPASS DETAIL

Scale: N.T.S.

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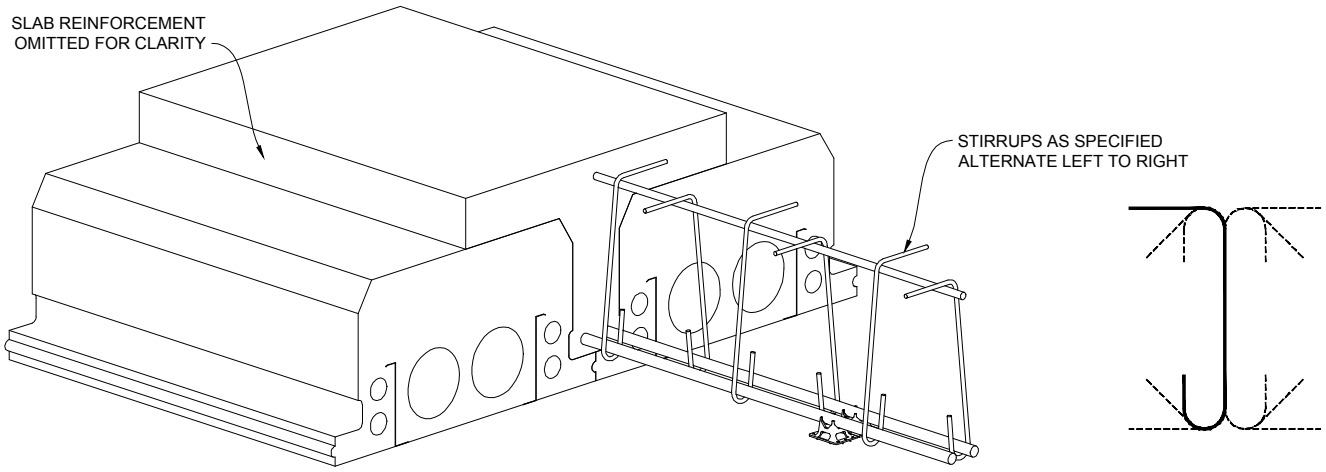
QUAD-DECK CONCRETE JOIST BYPASS

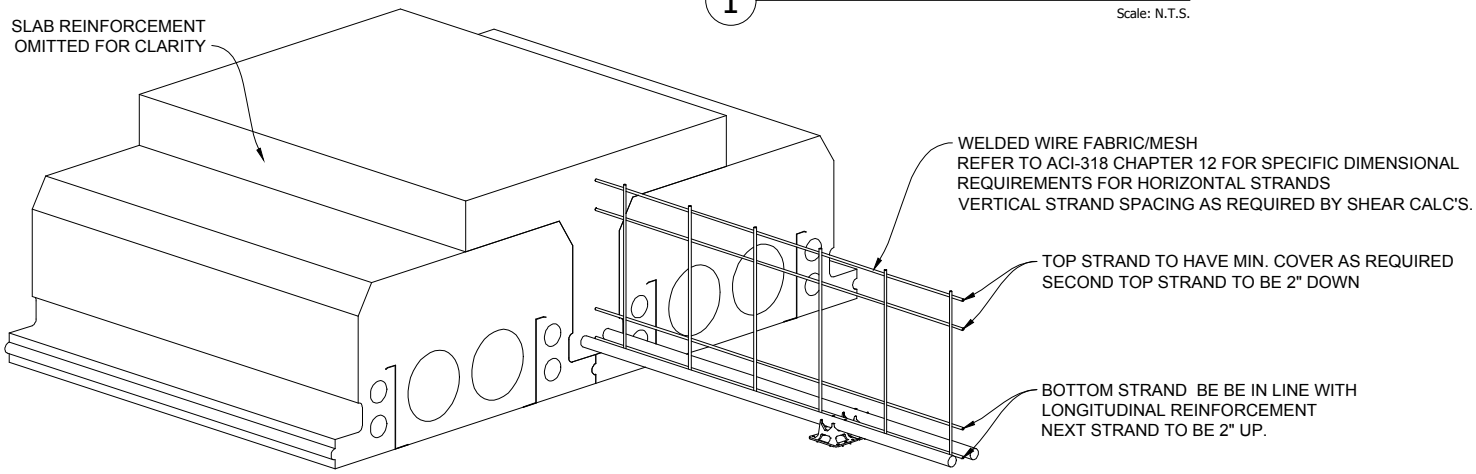
DATE DRAWN:	2015-08-25	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-806



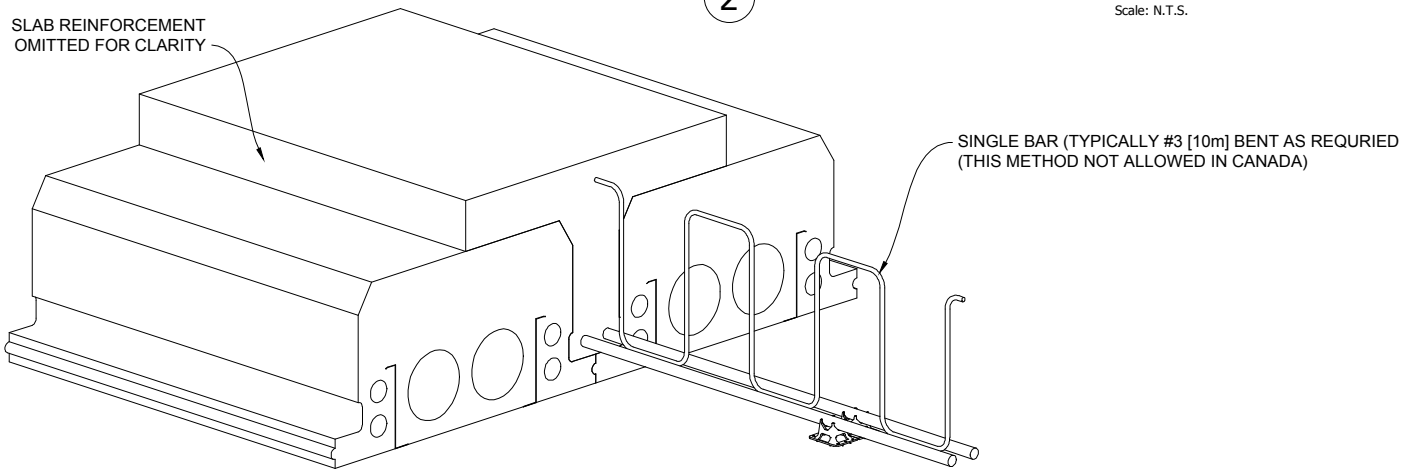
1 SHEAR REINFORCEMENT OPTION 1

Scale: N.T.S.



2 SHEAR REINFORCEMENT OPTION 2

Scale: N.T.S.



3 SHEAR REINFORCEMENT OPTION 3

Scale: N.T.S.

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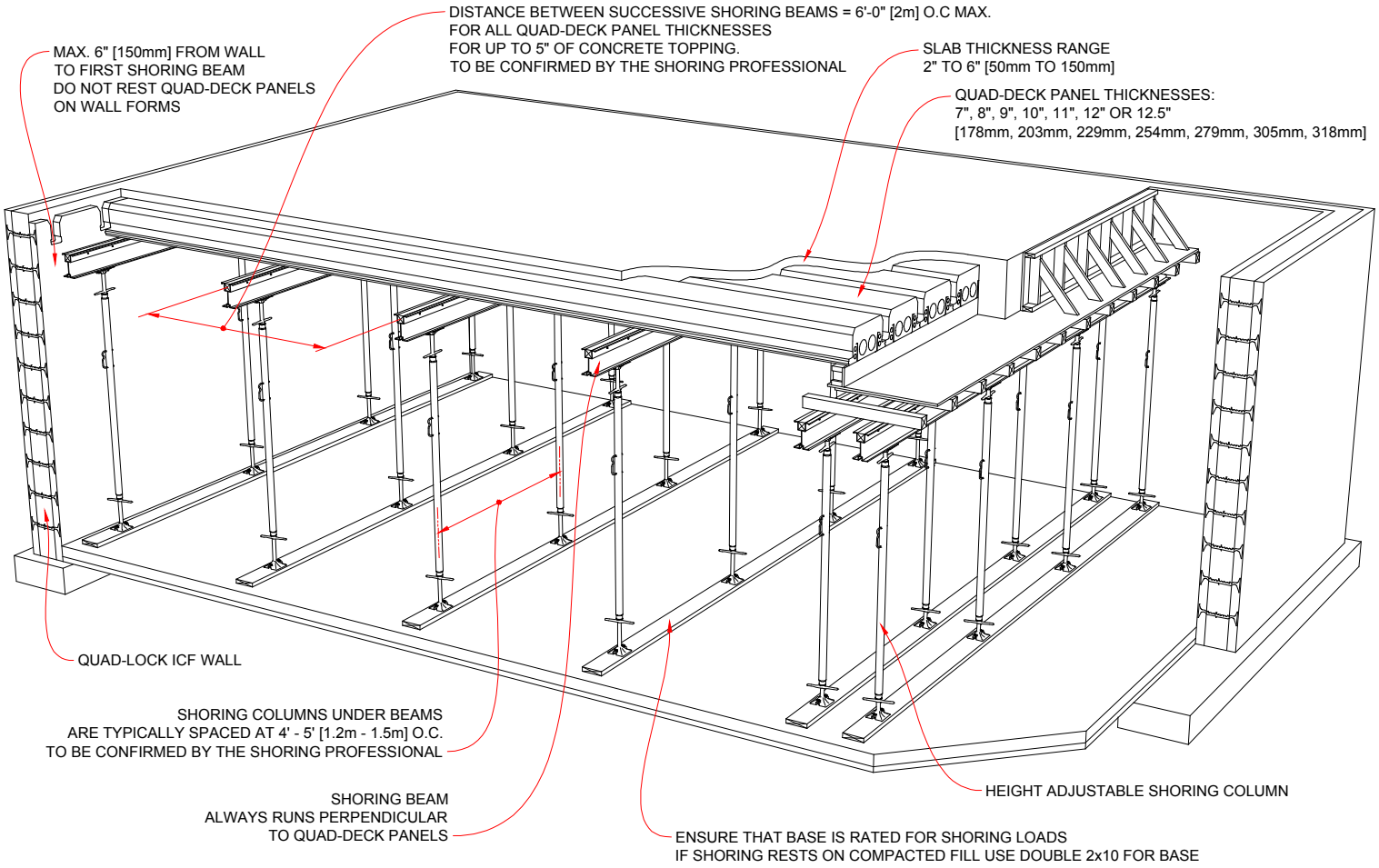
SHEAR STIRRUP OPTIONS

DATE DRAWN: 2015-08-25		COMMENTS: N/A	
REVISION NO: YYYY-MM-DD		SHEET SIZE: 8.5" x 11" [216mm x 279mm]	
REVISION DATE: N/A		SCALE: NOT TO SCALE	DRAWING NO: QD-807
DRAWN BY: Z. PROSTRAN		APPROVED BY: G. KUSTERMANN	



1 TYPICAL QUAD-DECK SHORING LAYOUT

REINFORCEMENT OMITTED FOR CLARITY

SHORING AND BRACING:
INSTALLER IS RESPONSIBLE FOR THE DESIGN AND CORRECT INSTALLATION OF SHORING OF QUAD-DECK FORMS IN ACCORDANCE WITH ACI (AMERICAN CONCRETE INSTITUTE) 347-04 "GUIDE TO FORMWORK FOR CONCRETE" OR CURRENT APPLICABLE CODES. ANY VARIANCE FROM THESE STANDARDS MUST BE PROVIDED AND CERTIFIED IN ADVANCE BY A STRUCTURAL ENGINEER, LICENSED FOR THE JOBSITE LOCATION AND SPECIFICATIONS.

Quad-Deck Floor Weights (lb/sqft)

Quad-Deck Panel Thickness	Slab Thickness			
	2"	3"	4"	5"
7"	45.1	57.6	70.1	82.6
8"	47.3	59.8	72.3	84.8
9"	49.5	62.0	74.5	87.0
10"	51.7	64.2	76.7	89.2
11"	53.9	66.4	78.9	91.4
12"	56.2	68.7	81.2	93.7
12.5"	57.3	69.8	82.3	94.8
Notes:				

The above are unfactored estimated weights which include concrete (150pcf), reinforcement (3lb/sqft), Quad-Deck Panel (2lb/sqft) and misc. (2lb/sqft)

Quad-Deck Floor Weights (Kg/m2)

Quad-Deck Panel Thickness	Slab Thickness			
	50mm	90mm	110mm	130mm
178mm	218.8	314.8	362.8	410.8
203mm	229.6	325.6	373.6	421.6
228mm	240.4	336.4	384.4	432.4
254mm	251.2	347.2	395.2	443.2
279mm	262.0	358.0	406.0	454.0
305mm	272.8	368.8	416.8	464.8
318mm	278.2	374.2	422.2	470.2
Notes:				

The above are unfactored estimated weights which include concrete (2400Kg/m3), reinforcement (15Kg/m2), Quad-Deck Panel (10Kg/m2) and misc. (10Kg/m2)

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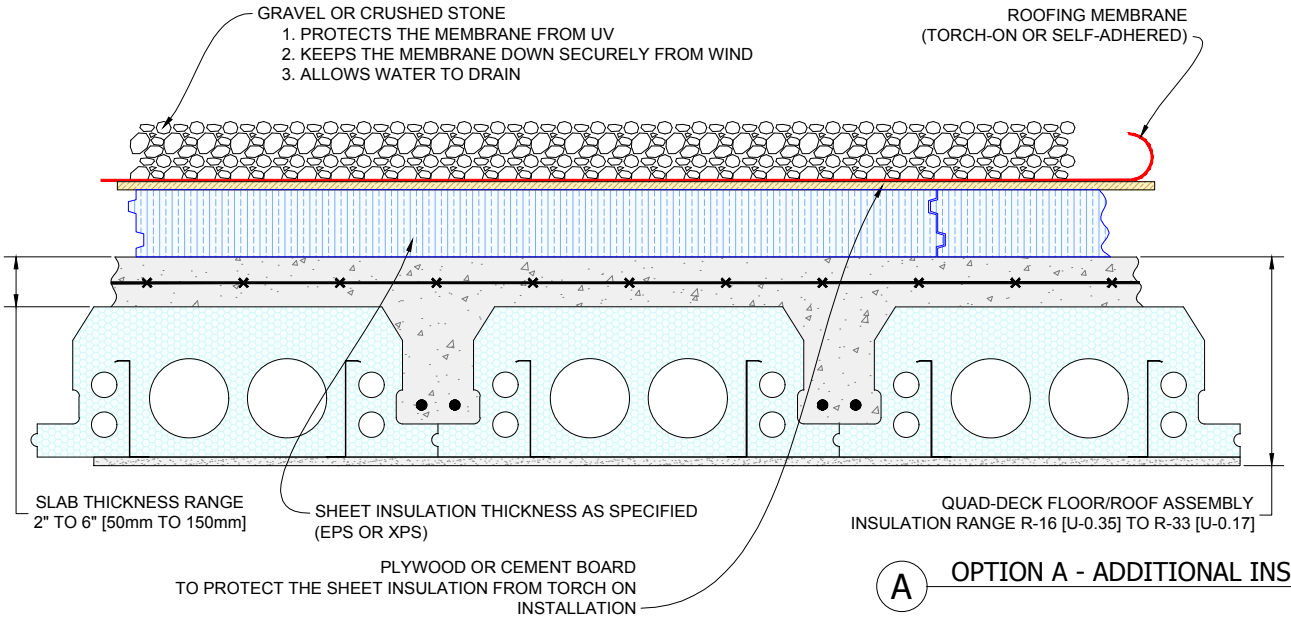
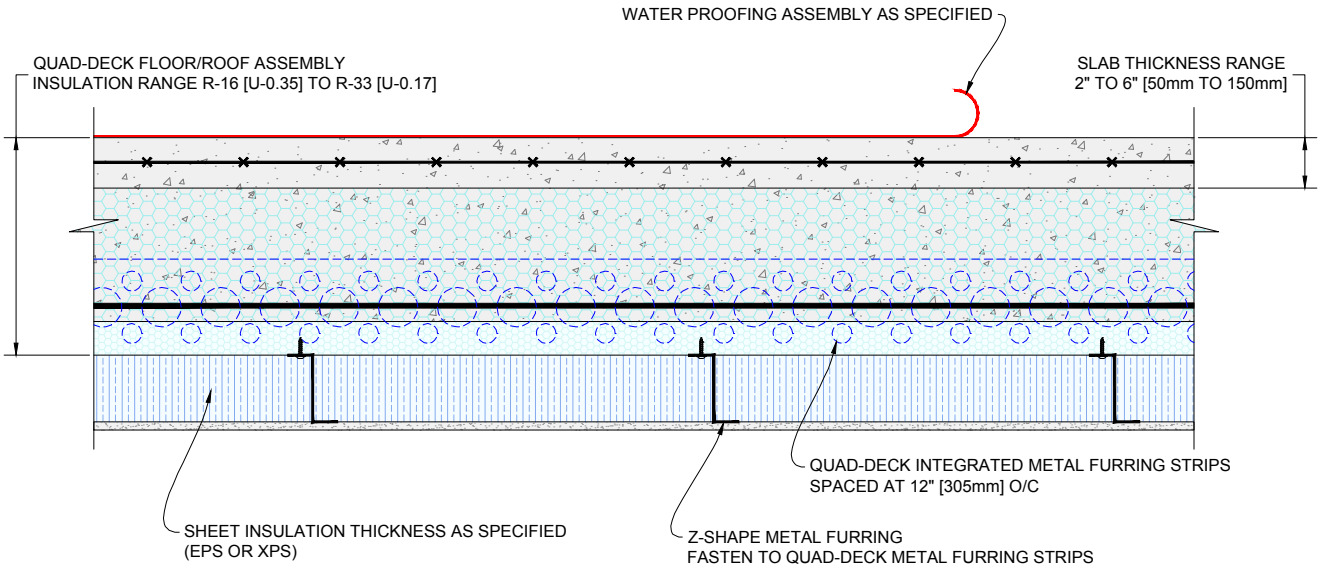
QUAD-DECK SHORING DETAIL

DATE DRAWN: 2015-08-25		COMMENTS: N/A	
REVISION NO: YYYY-MM-DD		SHEET SIZE: 8.5" x 11" [216mm x 279mm]	
REVISION DATE: N/A		SCALE: NOT TO SCALE	DRAWING NO: QD-808
DRAWN BY: Z. PROSTRAN		APPROVED BY: G. KUSTERMANN	



A OPTION A - ADDITIONAL INSULATION

Scale: N.T.S.



B OPTION B - ADDITIONAL INSULATION

Scale: N.T.S.

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ADDITIONAL ROOF INSULATION OPTIONS

DATE DRAWN:	2015-09-01	COMMENTS:	N/A
REVISION NO:	YYYY-MM-DD	SHEET SIZE:	8.5" x 11" [216mm x 279mm]
REVISION DATE:	N/A	SCALE:	NOT TO SCALE
DRAWN BY:	Z. PROSTRAN	APPROVED BY:	G. KUSTERMANN

DRAWING NO: QD-809