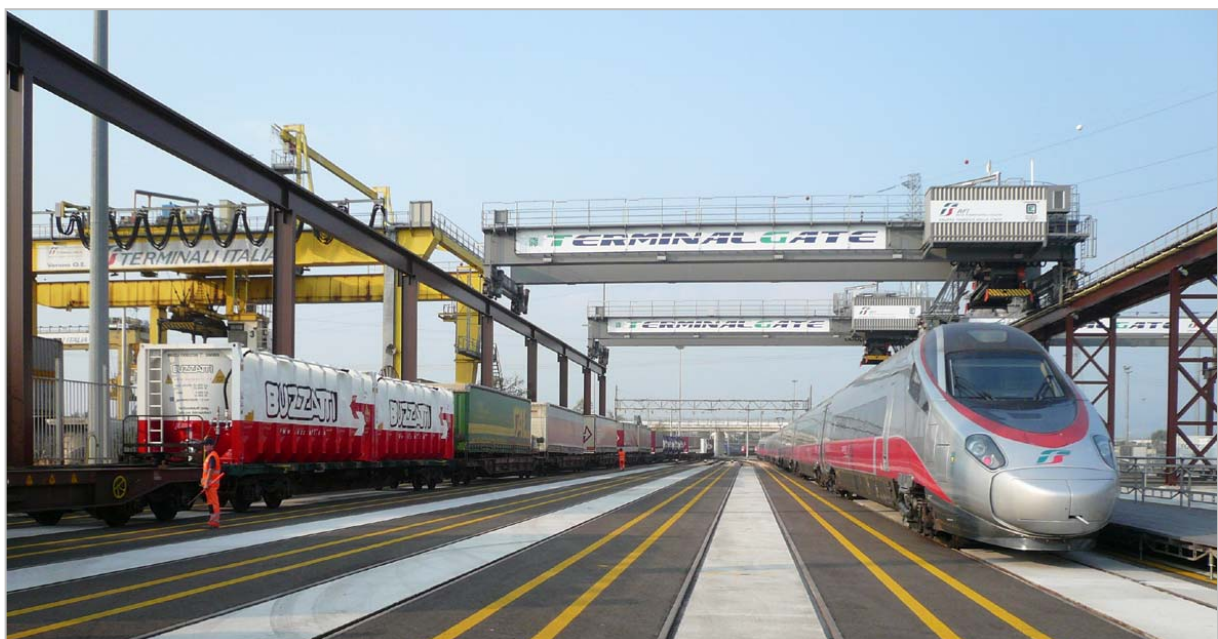

Owner Quadrante Europa Terminal Gate S.p.A.,
Via Sommacampagna 61, I-37137 Verona (Italy)

Tuchschnid's Scope of Work To design, supply and deliver an intermodal container terminal consisting of 2 pairs of bridge crane tracks set high on steel stanchions, a transshipment module and a storage module with a total of 3 container bridge cranes and five horizontal transfer units.

- Key Features**
1. Three overhead bridge cranes to achieve fast lift and travel speed, higher productivity and low energy consumption.
 2. Modular construction to separate road and rail handling at peak times.
 3. Automated horizontal transfer units to move containers and swap bodies between rail transshipment and storage modules & vice versa, to eliminate road shunting movements within the terminal area.
 4. Co-located container storage and transshipment modules to maximise use of available space and eliminate handling movements of Reach Stackers in storage areas.
 5. The terminal is designed to handle trailers in addition to containers and swap bodies.

Project Description & Data The most modern intermodal container terminal in Europe, COMPACTTERMINAL Terminal Gate, in northern Italy, is situated at the intersection of two major European rail freight routes, the north-south corridor through the Brenner Pass linking Germany with Italy and the East-West corridor linking Portugal, Spain and Southern France with Eastern Europe and Russia. Verona also benefits from the direct connection to its international airport and its close proximity to the Adriatic ports, providing the foundation for quick forwarding of goods by air and sea.



Concept

The high-tech container handling terminal in Verona is built on an area of 40,000 m², a relatively small area with high container handling output that is mastered with the technology of the COMPACTTERMINAL. At present three bridge cranes and five of the latest generation horizontal transfer units ensure the rapid transshipment of containers from road to rail or vice versa.

The terminal is designed for a maximum of 17 trains per day with a handling capacity of 300,000 TEU's. In order to provide smooth, fast and safe operations, the terminal is designed with crane speeds of up to 200 meters per minute. The design concept provides for future expansion for up to 3 cranes per module.

Transshipment Module

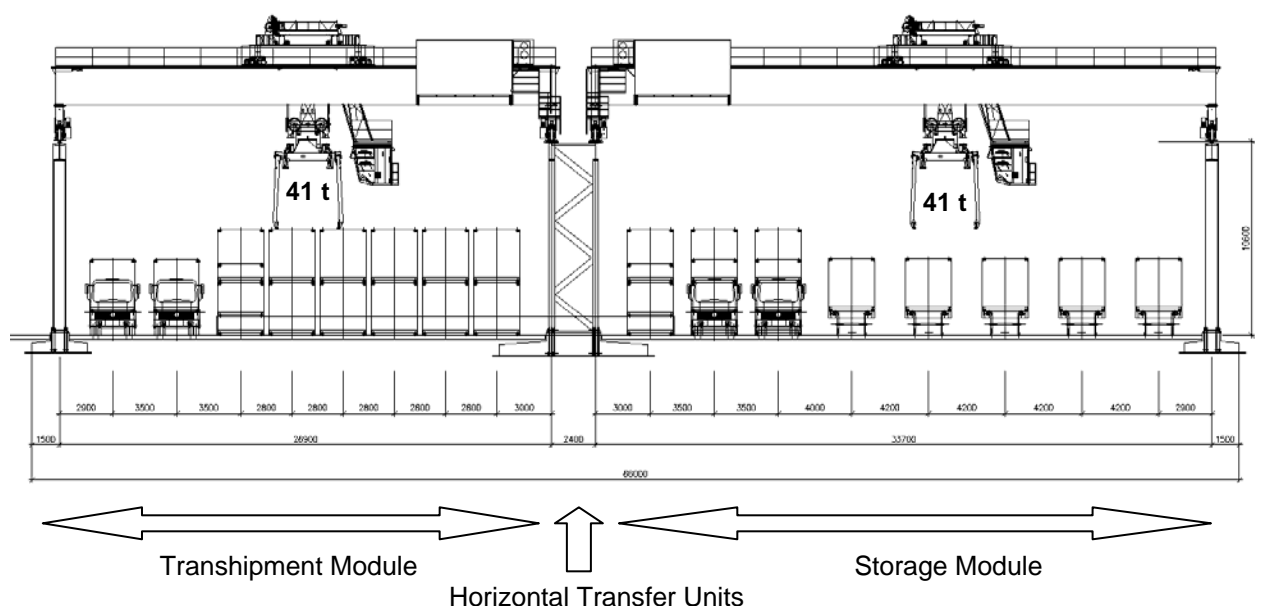
The transshipment module spans 34 meters, with five rail tracks, two road lanes and a storage lane and is equipped with two container cranes. The transshipment module provides for direct handling of swap bodies, ISO containers and trailers between rail - rail, road - rail as well as horizontal transfer to the storage module. The storage lane provides short term storage of load units (2 high for ISO containers). During peak times, the road lanes can be closed and used for short-term storage. The road transshipments are then handled in the storage module.

Storage Module

The 27 meter wide storage module spans six storage lanes and two road lanes and is equipped, in the first phase with one crane. The crane handles and manages the stored units and provides transshipment between storage and road or horizontal transfer to the transshipment module. ISO containers can be stacked 2 high in the storage module.

Horizontal Transfer Units

Five horizontal transfer units serve as the connecting element between the transshipment and storage modules. The automatic transfer units move the containers to and from the appropriate module and are controlled and managed from the cranes. This eliminates the need for road shunting movements between storage areas and the rail terminal and replaces reach stacker operations within the former storage zones.



Technical Data

Project data

Terminal Length	554 m
Terminal Width (2 modules)	66 m
Height of the steel structure	10 m
2 container cranes, span	34 m
1 container crane, span	27 m
Load on the spreader	41 to

Transshipment Module



Two double girder bridge cranes with a span of 33.7 m travel on crane tracks set high on steel stanchions over a length of 554 m. The telescoping twist-lock spreader can accommodate 20' - 40' and 45' ISO containers using the 40' twist-lock position. Integrated grapple arms for handling swap bodies, such as C715/C745/C782 and trailers are included. The trolley provides 200° slewing capabilities for accurate positioning of the load units on the transport carrier. Precise and fast positioning are achieved through continuously variable speed controls and swing-dampened cables

- Length of Transshipment Module 554 m
- Width of Transshipment Module / Span 33,7 m
- Number of working lanes
 - Rail Tracks (can also be used as short term storage) 5 x 554 m
 - Road Lanes (can also be used as short term storage) 2 x 554 m
 - Storage Lanes 78 TEU (1-high) or 156 TEU (2-high) 1 x 554 m
 - Total no of Lanes 8
- Theoretical ISO container handling capacity: approx. 40 / h
- Theoretical swap-body handling capacity: approx.32 / h

The Transshipment Module includes the following components:

Double-girder overhead bridge cranes

		2
• Span		33,7 m
• Load capacity on cables		55 tonnes
• Travel speed		0 - 200 m/min
• Trolley speed		0 – 60 m/min
• Hoisting speed	-partial load up to 16 tonnes	0 – 40 m/min
	-full load up to 41 tonnes	0 – 20 m/min
• Slewing		0-2 rpm
• Crane cab		heated and air-conditioned
• Weight of crane and trolley		120 tonnes / crane

Spreader		1 per crane
• Telescoping		20' – 40'
• grapple arms		3.6 m clearance
• load capacity		41 tonnes
• weight of spreader		approx. 14 tonnes

Crane Track		
• Length		554 m
• Crane track height		10.6 m

Storage Module



One double girder bridge crane with a span of 26.9 m travels on crane tracks set high on steel stanchions over a length of 554 m. The telescoping twist-lock spreader can accommodate 20' - 40' and 45' ISO containers using the 40' twist-lock position. Integrated grapple arms for handling swap bodies, such as C715/C745/C782 and trailers are included. The trolley provides 200° slewing capabilities to provide accurate positioning of the load units on the transport carrier. Precise and fast positioning are achieved through continuously variable speed controls and swing-dampened cables

- Length of Storage Module 554 m
- Width of Storage Module 26,7 m
- Storage area approx. 9'300 m²
- Number of working lanes
 - Storage lanes 6 x 554 m
 - Road Lanes (can also be used as short term storage) 2 x 554 m
 - Total no of Lanes 8
- Storage capacity approx. 528 TEU's (1-high)
approx 1056 TEU's (2-high)

- Theoretical ISO container handling capacity: approx. 40 / h
- Theoretical swap-body handling capacity: approx.32 / h

The Storage Module includes the following components:

Double-girder overhead bridge crane

- Span 26.9 m
- Load capacity on cables 55 tonnes
- Travel speed 0 - 200 m/min
- Trolley speed 0 – 60 m/min
- Hoisting speed -partial load up to 16 tonnes 0 – 40 m/min
-full load up to 41 tonnes 0 – 20 m/min
- Slewing 0-2 rpm
- Crane cab heated and air-conditioned
- Weight of crane and trolley 110 tonnes / crane

- Spreader 1 per crane
- Telescoping 20' – 40'
 - grapple arms 3.6 m clearance
 - load capacity 41 tonnes
 - weight of spreader approx. 14 tonnes

Crane Track

- Length 554 m
- Crane track height 10.6 m

Horizontal Transfer Units



The five Horizontal Transfer Units are evenly distributed over the entire length of the terminal. They consist essentially of a chassis with four wheels on tracks and a platform that can accommodate any load unit. Load units are placed by the crane directly onto the platform. When the crane exits the immediate area the horizontal transfer unit automatically moves from one module to the other. This movement is possible in both directions. The transfer units are enclosed within surrounding security fence to ensure a safe working environment. Two additional horizontal transfer units can be added to the terminal at any time in the future.

- Travel distance 8.7 m
- Secured area of Transfer units 185 m²/unit
- Theoretical container handling capacity: approx. 20 / h

The Horizontal Transfer Units comprise of the following components:

- Length of track 12 m
- Length of platform 14 m
- Width of platform 2.8 m
- Load capacity 41 tonnes
- Weight of platform 8 tonnes
- travel speed
 - without load 0 – 60 m/min
 - full load up to 41 tonnes 0 – 30 m/min

Operational Requirements

The concept of this terminal was based on the following criteria:

- ISO container handling capacity up to 40 Units / hour
- Swap Body and Trailer handling capacity up to 32 Units / hour

- Annual capacity (load units in-out) first phase 2 + 1 cranes: approximately 170,000
- Annual capacity (load units) second phase 2 + 2 cranes approximately 240,000
- Including future expansion 3 + 2 cranes approximately 300,000

- Percentage of load unit types
 - ISO Containers 25 %
 - Swap Bodies 45 %
 - Trailers 30 %

Key Elements

The core of this terminal is the three container cranes, the structural steel and the five horizontal transfer units. In addition civil engineering works such as site survey, engineering, groundwork, tracks, road works, paving, mortar, retaining walls, lighting, holding tanks, fixtures, fittings and signage as well as integration of logistics IT were supplied by the customer.

Special Challenges

Tuchschnid specializes in sophisticated, customer specific, bespoke solutions. At Terminal Gate, Tuchschnid provided the client even at the earliest stages of business planning with technical support. The special requirements of Terminal Gate were integrated into the terminal design through an interactive process with the client at the concept phase. Tuchschnid then planned executed the construction of he terminal.

