

DESIGN FOR A TERMINAL RAILWAY STATION

BY

FRANK T. KEGLEY, JR.

THESIS

For the Degree of Bachelor of Science

in Architecture

College of Engineering

University of Illinois

PRESENTED JUNE, 1908

UNIVERSITY OF ILLINOIS

June 1, 1908

THIS IS TO CERTIFY THAT THE THESIS PREPARED UNDER MY SUPERVISION BY

FRANKLIN THOMPSON KEGLEY, JR.

ENTITLED DESIGN FOR A TERMINAL RAILWAY STATION

IS APPROVED BY ME AS FULFILLING THIS PART OF THE REQUIREMENTS FOR THE

DEGREE OF Bachelor of Science in Architecture

J. W. Dease

Instructor in Charge.

APPROVED:

N. Clifford Pickett

HEAD OF DEPARTMENT OF Architecture

Thesis.

A Terminal Railway Station.

By

Frank T. Kegley Jr.

This article upon the requirements and planning of terminal railway stations is not intended to apply, in more than a general way, to the accompanying drawings, but treats of a station ideal in so far as it fullfils all the requirements of a modern railway terminus.

The material here given has been collected, principally from personal inspection of the terminals in Chicago, Illinois; from 'Berg's Building and Structures of American Railroads'; and from articles in the 'Railroad Review'; 'Railroad Gazette'; 'Engineering' and Engineering News.

For assistance in preparing the accompanying drawings I am indebted to D. H. Burnham and Co., Architects, and to Mr. A. H. Granger of Frost and Granger, Architects, Chicago.

General Conditions.

Terminal Passenger stations are buildings erected for accomodation of the passenger service, and for the transaction of all business connected with the railroad such as would, of necessity, be required at the terminus of the railroad.

Such stations are usually located in large cities or towns, at ferry terminals, or at important junction points of several railroads.

In general the style and size of the building will depend upon the proposed location of the building with reference to the topographical features of the site; the amount and form of the land available; the location and elevation of the tracks with reference to the neighboring streets; the location of the track approaches with reference to the terminal site; the facilities required; and the importance of the locality.

No general style can be recommended for the exterior of terminal passenger stations nor would it be desirable to mould all such buildings after one pattern, but in general it may be said, that the character of the building should be expressed in its exterior, the structure should be built on broader and grander lines than local stations, presenting a bold and prominent front relieved by proper division and fenestration.

Classification.

Terminal passenger stations may be divided into the two classes, Side-stations and Head-stations. At side stations the depot building is situated along side of the tracks, at the head-stations, across the dead end of the tracks. Often in side stations

there are depot buildings on both sides of the tracks: either the main building is on one side and some additional facilities for baggage or express, or waiting rooms on the other side, or there are main buildings on both sides, with a more or less double complement of accommodations for the passenger and baggage service, in which case the station is classed as a Twin-Station. Head stations are frequently built with wings extending from the head-house along one or both sides of the tracks, forming an L or U shaped building. In this way some of the features of the side-stations are blended into those of the head-station.

In terminal passenger stations provision has to be made for a very large number of facilities and accommodations for the different branches of the service. A study of the list given below will impress one with the magnitude of the problem, when it is considered that all these interests, as far as required in any particular case, have to be provided for and placed not only in their proper relation to the building as a whole, but also in suitable relation to each other.

In many cases duplicate accommodations have to be provided so as to cover the 'IN and Out' business in each branch.

The facilities and accommodations at terminal passenger stations, that have to be provided to a greater or less extent according to the requirements in each particular case, which are actually found in use in the stations of the United States, are as follows, grouped in the various branches of the service.

1.- Passenger Service.

Waiting rooms, consisting of a general waiting room, gentlemen's waiting room, Ladies waiting room, Ladies parlor

reading room and smoking room.

Ticket office, with ticket windows leading to a vestibule or to the general waiting room; ticket agent's private office and vault, and ticket office for sleeping or palace car service.

Dressing room, toilet room and lavatory for ladies.

Toilet room, barber shop for gentlemen.

Public telegraph, telephone, messenger service, U. S. mail, Express office.

Parcel, hand baggage and coat room.

Bureau of Information, time table, newspaper and book stand.

Cigar, fruit and candy stand.

Restaurant and dining service with all necessary appurtenances such as kitchen, pantries, serving room etc.

Reception room for holding conferences or receiving prominent guests.

Carriage, cab and omnibus stand or court with agents office and room for hackman.

Entrance vestibules, lobbies near trains for the congregating of outgoing crowds and departure and arrival platforms between the tracks.

Elevators for passengers where the tracks are not on a level with the street.

11.- Baggage, Express and Mail Service.

Baggage rooms, consisting of separate rooms for incoming and outgoing baggage, store room for lay-over, transfer or unclaimed baggage, truck stand, together with office for baggage master, clerks and porters and the necessary frontage for receiving and delivering baggage to and from wagons.

Express, same as for baggage.

U. S. Mail accommodations for 'in and out' mail.

III.- Station Service.

Gate Keepers office and porters room.

Station Masters office.

Train Masters "

Conductors report room.

Physicians office, Hospital ward for emergencies.

✓ Car cleaners supply room.

✓ Trainmens room.

✓ Station Police office.

IV.- General Office.

President's offices,- Private, general and clerks.

Vice President's Offices,- " " " "

Treasurer's " " " "

General Superintendent

and Assistant's offices,- " " " "

General Passenger Agent and

Assistant's offices,- " " " "

and ticket case room.

Tariff freight offices.

Auditing department.

Superintendent of Machinery,- Office and draughting room.

Architectural Department " " " "

Bridge engineer,- " " " "

Legal Department,- Offices, library, consultation room and
claim department.

Road Surgeon,- Private and general offices.

General Requirements of Planning.

The growing importance and grandeur of the terminals in large cities have brought about the necessity of an important and suitable location.

For such a location we would naturally turn to the center of industry of the city and in order to reach it with the tracks the question of grade crossings becomes the all important one, however, grade crossings are not practical, in that they are dangerous and expensive to guard and so of recent years, American companies following the example of European railroads have turned to elevating or depressing the tracks within the city limits, so with the elevating or depressing of the tracks the planning of a terminal station at the head of them becomes a problem of levels. In either arrangement we would consider two levels, grade and track, but the distribution and division of the departments in the two cases would be entirely different. With the tracks elevated the ground floor at grade level would be devoted to an entrance lobby, ticket office, 'in and out' baggage and cable and carriage courts. At the track level we would arrange for a series of waiting rooms, and a concourse running the full width of the tracks between them and the general waiting room.

It is essential that incoming passengers be able to reach the street from the concourse without going through the waiting rooms.

The general waiting room should be made the chief feature of a group of waiting rooms and should preferably be located in the center portion of the head house in case the building is a head terminal, or in the front corner in case the building is a side terminal.

This arrangement brings the main passenger traffic through this room and avoids intrusion into the ladies or gentlemen's waiting rooms. This general waiting room should contain the News stand, information bureau and telegraph and telephone offices.

The ladies apartments, consisting of a waiting room, parlor, and retiring room, should be made as comfortable as possible by the introduction of such features as fireplaces, pleasing decorations and fine furnishings. This should be especially true of the ladies parlor.

The baggage rooms should be so located that the moving of baggage to and from trains should not interfere with the passenger traffic. Since the outgoing baggage remains in the station for only a short time, as compared with the incoming, this room may be made smaller than the other. For convenience, the baggage rooms are best grouped together and connected with the express and mail service.

The dining room, restaurant and lunch rooms are best placed at the waiting room level and in direct connection with it. In connection with this department it is customary to provide rooms in the building for the use of the help employed.

In planning the arrangement of the general offices it is best for the facilitating of business to group together, as closely as possible, those separate offices, or groups of offices, which from the nature of their work are most intimately connected. Private offices should be arranged to open off general or clerks rather than corridors.

Those departments using draughting rooms are preferably located on the upper floor in order that they may get the benefit

of light obtained through skylights.

Essential to a station of this class is a large train shed varying in size according to the number of tracks, which should naturally be an important factor in the design. The principal point to be observed in a train shed are that it be well lighted and ventilated, free from all unnecessary supports, and wide enough to permit of platform at least 12 feet wide between the tracks. In respect to the safety of passengers the head station affords the best conditions as compared with the side station, in that no crossing of tracks is necessary.

Having thus considered the requirements of the plan, it will be interesting to see how nearly stations actually in use, fulfill the requirements set forth, and to consider the space actually allotted to the different departments.

Washington D. C. Union Station.

The head house, or station building proper, is 620 feet long and from 65 to 120 feet in height. The general waiting room has a clear width of 120 feet and a length of 220 feet and is covered with a Roman barrel vault. It is lighted by a semicircular window 78 feet in diameter at each end and by three semicircular windows 30 feet in diameter at each side. Around this hall are grouped the dining room, lunch room, telephone, telegraph, parcel room, smoking room and women's waiting room, while the ticket offices and baggage rooms are on opposite sides of a lobby 50 feet wide opening directly from the waiting room. While virtually forming a part of the waiting room this lobby serves as an entrance and exit to the carriage porch.

The smoking room and women's waiting room are both 35 feet

wide, 85 feet long and 28 feet high with windows looking toward the plaza.

The dining room is 80 feet wide, 100 feet long and 35 feet high with a kitchen on the floor above.

The passenger concourse is 130 feet wide, 760 feet long covered by an arched ceiling of single span.

There are in all, 33 tracks twenty of which are 'stub' tracks on the same level as the waiting room and constitute the terminal station. The remaining 13 tracks are depressed 20 feet below the waiting room or street level and 9 of them continue under the building to a tunnel which leads to the southward, and constitute a through station.

St Louis, Mo. Union Station.

The head house is 456 feet long by 80 feet wide. The basement floor is on a level with the tracks and the passenger concourse in the center contains 10,530 square feet. The telegraph office in this story has a mezzanine floor. The floor of the carriage concourse is on a level with the street and about 4 feet higher than the track. On the main floor the general Waiting room aggregates 10,530 square feet; the gentlemen's rooms 3,330 square feet, and the ladies including retiring and matrons rooms 5760 square feet; the dining room 4500 and the smoking room 2340 square feet.

The main entrance is approached by an inclined walk from either side so that there are no steps to climb.

Boston, Mass.

Boston and Providence R. R.

Head house	30,000	Square feet.
Train shed	78,000	" "
Entrance lobby	900	" "
General Waiting Room	13,500	" "
Mens rooms	4,000	" "
Ladies rooms	3,000	" "
Toilets	1,000	" "
Ticket offices	2,000	" "

Philadelphia, Pa.

Philadelphia and Reading R. R.

Outbound baggage	6,000	Square feet.
Inbound baggage	7,000	" "
General Waiting Room	8,000	" "
Loggia	1,800	" "
Ladies Rooms	2,000	" "
Dining room	3,200	" "
Restaurant	2,400	" "
Concourse	50	" "
Carriage Court	74	" "
Train shed	260 ft. wide, 13 tracks.	

In order to form a definite idea of the proportionate amount of space to be devoted to each department I have prepared by averaging data from ten large terminals, the following table which gives the amount of floor space to be devoted to each department for one track entering the station.

Train shed	15,000 square feet. per. track
General waiting room	820 feet.
Mens rooms	400 "
Ladies rooms	350 "
Smoking room	175 "
Dining room	250 "
Ticket rooms	300 "
Baggage room	800 "