

MISSOURI, KANSAS & TEXAS RAILWAY,
BELLMEAD YARD
Union Pacific Milepost 842.40
Bellmead
McLennan County
Texas

HAER No. TX-74

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

FIELD RECORDS

HISTORIC AMERICAN ENGINEERING RECORD
Southwest System Support Office
National Park Service
P.O. Box 728
Santa Fe, New Mexico 87504

HISTORIC AMERICAN ENGINEERING RECORD

MISSOURI, KANSAS & TEXAS RAILWAY, BELLMEAD YARD

HAER No TX-74

Location: Union Pacific Milepost 842.40
Bellmead, McLennan County, Texas

USGS Bellmead, Texas Quadrangle,
Universal Transverse Mercator Coordinates
14.68063.349576

Present Owner: Union Pacific Railroad

Present Occupant: Union Pacific Railroad

Present Use: Switching Yard and fueling depot

Statement of
Significance:

The Bellmead Yard, located 2.8 miles northeast of Waco, Texas, in the Town of Bellmead, includes buildings that were designed in the offices of the Missouri, Kansas & Texas of Texas Railway Company's Chief Engineer during 1922-23 and constructed in 1923. The railroad was renamed the Missouri-Kansas-Texas (M-K-T) in 1923, and the new moniker was molded in decorative terra cotta tile emblems that embellished the site's most prominent building – the Warden Locomotive Shops.

The Bellmead Yard serviced steam locomotives and switched rolling stock in the central Texas transportation hub. The site includes the Warden Locomotive Shops, a Power House, an Oxygen-Acetylene House, and a Car Foreman's Office – all of which exhibit a high degree of integrity. These properties each became part of a larger railroad complex that also included a roundhouse, emergency hospital, paint and blacksmith shops, storehouses, power transformers, and fuel depots.

M-K-T operated the Warden Locomotive Shops until diesel engines replaced steam locomotives in 1947. The railroad closed the facility in the mid-1950s. The property remained vacant until the late 1960s. From 1968-72, M-K-T leased the property to a local defense contractor for the manufacture of bomb casings for the Vietnam War. After the war, the Warden Locomotive Shops, Power House, and Oxygen-Acetylene House were abandoned and much of the equipment scrapped. M-K-T sold the yard to the Union Pacific Railroad (UP) in 1988. The Car Foreman's Office remained in use by the company through 1997.

PART I: HISTORICAL INFORMATION

A. Physical History

1. Date of Erection: 1923
2. Architect/Engineer: A.G. Sparks, architect; H. Reiger, engineer, Office of the Chief Engineer, Missouri, Kansas & Texas Railway Company of Texas, St. Louis, Missouri
3. Original and Subsequent Owners: Missouri, Kansas & Texas Railway of Texas (1912- 1923)
Missouri-Kansas-Texas Railroad Company of Texas (1923-1988)
Union Pacific (1988-present)
4. Builders, Contractors and Suppliers: M-K-T Bridge & Building Crews; Mt. Vernon Bridge Company, Mt. Vernon, Ohio (Structural steel fabricators); R.W. Hunt & Co. (Structural steel inspectors); Hill Bros., Waco, Texas Heating Contractor); John O'Brien Boiler Works Co.
5. Original Plans and Construction Drawings: Office of the Chief Engineer, Missouri, Kansas & Texas Railway of Texas, 57 drawings (drawn 1922, revised 1923; drawn 1923, revised 1924); Mt. Vernon Bridge Company, 2 drawings (drawn 1922, revised 1923); Office of the Chief Engineer, Missouri-Kansas-Texas Railroad Company of Texas, 3 drawings (1953).
6. Alterations and Additions: The buildings at the Bellmead Yard were altered at several indeterminate dates in time.

- B. Historical Context: The Missouri, Kansas & Texas (MK&T) Railway Company's Bellmead Yard was established in Bellmead, Texas, in 1912 in an effort to consolidate three locomotive and rolling stock facilities the company had acquired following its purchase of the Texas Central Railway Company (TC) two years earlier. Bellmead Yard underwent a major facility expansion in 1923. The new structures included the immense and state-of-the-art Bellmead Locomotive Shops (HAER No. TX-74-A) and the Bellmead Power House (HAER No. TX-74-B), as well as a number of smaller ancillary buildings – one of which was an Oxygen-Acetylene House (HAER No. TX-74-C). Other buildings were added to the site over time, such as the Car Foreman's House (HAER No. TX-74-D), which was moved from another location at an indeterminate date. The original buildings, erected in 1912, were razed at indeterminate dates.

By the time Bellmead Yard was opened, the MK&T, known in the vernacular as “the Katy,” had a forty-nine-year history dating to 1863. MK&T's inception lay in the passage of an act of Congress in March 1863. The legislation called for the development of a rail system that linked U.S. Army posts in the Midwestern states and supported the pre-existing congressional policy that supported western development by granting alternate sections of land to two railroads, one to maintain an east-west route and the other, a north-south route [1].

The initial result of the act was the construction of the Fort Union, Santa Fe & New Mexico Railroad as an east-west continental rail line. In 1863, a north-south route remained unchartered; however, Congress specified that a route be constructed southward from Emporia, Kansas, to a point where it connected with the Leavenworth, Lawrence & Fort Gibson Railroad and then, southward to the southern border of Kansas. The final destination was to be the Cherokee lands of Indian Territory [2].

In February 1865, the Union Pacific Railway, Southern Branch (UPRSB), precursor to the MK&T, proposed to build a railway along a southerly route from Fort Riley to Clarke's Creek and the Neosho River to the southern boundary of Kansas. The route also included corporate rights that extended through Indian Territory to Fort Gibson and Fort Smith [3].

By 1866, the Fort Union, Santa Fe & New Mexico, which later became the Santa Fe Railroad, had completed construction of the east-west route and undertook construction of a southern route through the Neosho Valley, ending at Chanute, Kansas. Unable to complete construction, the railway assigned its land grant to the UPRSB. The company accepted the offer on condition it construct the remaining portion of the line, and the transaction was ratified by the Kansas Legislature. On July 26, 1866, Congress vested UPRSB with rights to build Neosho Valley. In addition, if the carrier became the first to reach Indian Territory, it would be given a land grant to build the route through Indian lands. Construction of the line began in 1869 [4].

By February 1870 the UPRSB had laid ninety miles of track, which terminated at Burlington, Kansas, and had initiated passenger and freight service over a thirty-seven -mile route between Junction City and Council Grove. For undocumented reasons, the MK&T assumed the charter of

The UPRSB in April 1870. The MK&T immediately began its race to Indian Territory, its only remaining competition being the Missouri River, Ft. Scott & Gulf (MRFtS&G).

The MRFtS&G entered Indian Territory before the MK&T; however, Congress determined that the railway had entered the territory at the wrong location. From the onset, the Cherokee lands in Neosho had been the congressional objective. MRFtS&G mistakenly entered through Quapaw Reservation lands, some sixteen miles from Cherokee land and, as a result, the MK&T was given the land grant set forth in the act and continued its construction through Indian Territory. Immediately, the MK&T began construction of 160 miles of rail between Sedalia, Missouri, and Parsons, Kansas. Operating headquarters were established at Sedalia; Parsons was designated as the rail system's operating hub [5].

The MK&T then moved its focus to the construction of a 223-mile route along the Red River through Indian Territory, with a terminus at Preston, Texas. The MK&T found that construction through Indian Territory offered few opportunities for the generation of income. The enormous cost of constructing the line was offset by a government land grant that deeded every alternate section on both sides of the 223 miles of track to MK&T [6].

The fulfillment of the land grant, however, was thwarted by an Indian Council that battled the carrier in court for the right to maintain jurisdiction over the land. In court, the United States argued that several regiments of Indians had participated in the Civil War under the Confederate Army; therefore, the tribes had forfeited any rights to their land. A Cherokee lawyer, E.C. Boudinot, successfully countered the argument by contending that it was individuals, not tribes, who had joined the Confederacy. The case dragged on for nearly three decades and finally ended with a Supreme Court ruling in 1914, which stated that the MK&T had no rights to the land grant and could only utilize the standard right-of-way for track and facilities. Unable to build through Neosho during litigation, the MK&T focused its efforts on Texas [7].

In December 1872, the MK&T reached the Red River at the town of Preston and renamed it Denison, in honor of MK&T Executive Vice President George Denison. From that point, the MK&T continued its race through Texas, acquiring or establishing numerous short-line railway companies during this period. In January 1880, Jay Gould was named president of MK&T and turned the company's focus toward the development of the MK&T in Texas. His first task was to oversee a lease agreement between the MK&T and the Missouri Pacific (MP) in December 1880. The lease agreement led to the designation of the railway as the "KT" or the "Katy" when the MP put out public notices deeming the MK&T, the "K&T

Division of the Missouri Pacific Railway” [8].

Following the lease agreement, Gould purchased two branch lines in February 1881. One line traveled southeasterly along a fifty-two-mile route from Denison to Greenville. The second line was a forty-one-mile section, which connected Whitesboro to Gainesville. In that same year, Gould established an agreement that would prove beneficial to the “Katy” for the next half century. Gould gained trackage rights from the Texas & Pacific Railway from Whitesboro to Fort Worth and entered Fort Worth on April 1, 1881. The year 1881 proved to be a pivotal year in the development of the “Katy.” Gould authorized construction of several other projects, the largest of which was a rail line from Fort Worth to Taylor, Texas, a 161-mile route. In June of that same year, a fifty-mile stretch from Greenville to Mineola also was completed.

Also in 1881, Gould acquired the International and Great Northern Railway (I&GN) through a stock trade, linking the MK&T with San Antonio and Houston. He purchased the holdings of the East Line and Red River Railroad (EL&RR), which operated 124 miles of track between Greenville and Jefferson. At the close of that year, the MK&T also acquired the Dallas and Wichita Railroad, which connected Dallas to Denton, where it joined MK&T's Fort Worth and Whitesboro line [9].

Gould continued acquiring and building new routes in Texas in the following years. In 1882, Gould acquired the Trinity and Sabine Railway and completed a connection between Hillsboro and Taylor. Two years later, Gould extended a line to Colmesneil, finally connecting the MK&T's Trinity line with the rest of the “Katy” system. In 1886, Gould acquired the holdings of the Dallas & Greenville Railway Company, which created an integral link between Dallas and Greenville. The following year, track was extended seventy miles from Gainesville to Henrietta. In 1890, the Dallas line was extended to Hillsboro under the MK&T-controlled Dallas & Waco Railway Company and the “Katy” also initiated service between Denison and Sherman. In the following year, however, the Texas Railroad Commission (TRC) forced the MK&T to consolidate all of the companies and railways it had acquired.

This consolidation led to the formation of the MK&T of Texas and was ratified by the governor of Texas on April 16, 1892. The following year, operating under its new moniker, the carrier constructed 4.8 miles of track from Warner Junction to Ray, Texas, which became the primary switching yard for all freight trains. Denison became the main junction for passenger trains. In 1893, the MK&T gained entry into Houston and a connection was made with the Galveston, Houston & Henderson Railroad, providing access for “Katy” passenger service. In 1895, eighteen miles of track were laid between Henrietta and Wichita by the Wichita Falls Railway Company. The Katy leased the line and began operations through west Texas. The turn of the century saw the Katy's last period of major construction. By 1904, mainline construction had ended, although the company's purchase

of other railway companies continued in Texas and Oklahoma. One of the company's most important acquisitions was the Texas Central Railroad Company [10].

In 1910, the MK&T acquired ninety percent of the capital stock of the Texas Central (TC) and by 1914, had leased the line to itself for a period of ninety-nine years. Known in the vernacular of the period as the "TinCan," the TV operated a 268-mile system that connected Waco, which was becoming an important railroad hub in central Texas, with Rotan, DeLeon, and Cross Plains. When the Katy assumed operations of the company, it acquired TC's locomotive shops at Walnut Springs as well as a sharp increase in the number of engines and rolling stock. In 1912, the "Katy" lengthened what company officials defined as the "Fort Worth and Dallas divisions" by moving the engine terminal and crew change point from Hillsboro, thirty-one miles south to the town of Bellmead (Bellmead was 2.8 miles north of Waco). Crew changes from DeLeon were also transferred to Bellmead and a rail-yard (1,000-car capacity), a roundhouse, and a dispatcher's office were built [11].

After the successful acquisition and integration of TC's assets, MK&T company officials in St. Louis, Missouri, decided to consolidate the operations of three locomotive shops – Wichita Falls, Dension, and Walnut Springs – into a single, new facility at the junction of the Fort Worth and Dallas divisions in Bellmead [12]. The project was placed under the direction of the MK&T Office of the Chief Engineer in St. Louis, with H. Reiger, project engineer. The architect assigned to supervise the design of the new facilities was A.G. Sparks. When the project was initiated, the standards for locomotive shops had been well-established within the railroad community. Specifications for those and other types of buildings had been produced, endorsed, and approved by engineers who sat on the Board of Directors of the influential American Railway Engineering Association (AREA) in Chicago.

For some reason, MK&T's management and operations engineers in St. Louis decided to deviate from accepted engineering practices when designing the Bellmead Shops. As late as 1929, the AREA was publishing in its *Manual of the American Engineering Association for Railway Engineering* that for Engine House Design and Form "(a) the circular form under ordinary conditions is preferable; (b) special conditions may render a rectangular house desirable, such as restricted location, [or a] small number of engines handled; [and] (c) shops where a transfer table is used, a rectangular engine house served by a transfer table may be desirable" [13].

MK&T's engineers opted for a "rectangular engine house design" to handle not "a small number" but eighteen locomotives at a time and to use instead of "a transfer table," four powerful overhead electric traveling cranes." The choice of a rectangular engine house presumably resulted from the carrier's ten-year experience with the existing roundhouse at Bellmead, which it had built and operated since 1912. The new building, while deviating from some AREA design standards of the day, did, however, conform to or exceed others.

The AREA specifications for "Locomotive Shop Materials" included the following:

- (a) The materials used in construction of the house should be non-corrosive, unless proper care is taken to prevent corrosion;
- (b) The additional security against interruption to traffic from fire warrants serious consideration of the use of a fireproof roof or dividing the engine house into units of approximately ten stalls by the use of division walls of fireproof material;
- (c) The portion of the wall directly in line of the track where the engine is liable to run into it, should be so constructed as to be easily replaced or repaired when damaged [14].
- (d) The floors should be of permanent construction sloped so as to drain properly. The floor . . . where trucking is carried on and where most of the work is done, may advantageously be constructed of wood block, or vitrified brick on a concrete base, while the remainder of the floor between pits may for the sake of economy be of concrete [15].

Another AREA specification indicated: "As modern engine houses have stalls generally one hundred feet or more in depth, at least one break in [the] roof and if desirable, [a] complete monitor may be installed. Such breaks or monitors should be provided with pivoted sash or a combination of pivoted sash and fixed louvres depending upon climate" [16].

An additional AREA specification for "Windows" stated: "Large windows should be provided in the outer walls with a generous provision of ventilating sections. As near a continuous row of these ventilating sash as practicable [sic] should be provided along the top of the windows" [17]. Additional specifications for windows indicated the following:

- (a) The disadvantages of skylights are so much greater than their advantages as to make them undesirable.
- (b) Windows in the outer walls should be made as large as practicable with the largest glass or light area consistent with the strength of the structure. In general, the lower sill should not be more than 4 feet from the floor and the space between window frames and columns or pilasters and girders should only be [what is] necessary to secure the window frames. Windows in doors, where provided, should be furnished with wire glass [18].

The AREA specifications also addressed "Mechanical Handling Devices" by stating that: "[c]onsideration should be given in the design of an engine house to the use of traveling cranes, jib cranes or monorails and provision made in the design of the structure for future installation if such is considered probable" [19].

The Bellmead Locomotive Shops were designed to take advantage of state-of-the-art

technology of the period and were to be immense. Planned to be built of “fireproof construction,” with brick walls, a steel structure whose members were fabricated by Mt. Vernon Bridge Company and coated with “red lead and oil,” the building also was to have concrete floors and a roof of cement tile. The largest portion of the building – the Erecting and Flue Shops – consisted of nineteen 25' bays, a length in excess of 475'-0", and a height of 62'-1-3/4" [20]. The Erecting and Flue Shops also had a width in excess of 80'-0" at the east and west ends.

Other shop areas, including the Machine, Tank (Boiler), and Blacksmith Shops, were located in two smaller bays, which when combined were 142'-0" in width. Attached to the north side of the Erecting and Flue Shops, they increased the building's total width to 222'-0". The Erecting and Flue Shops had clerestories with operable sashes that were 53'-1" in height and the Machine, Tank (Boiler), and Blacksmith Shops had two monitors that ran the length of the building. They were fitted with “continuous top hung sash” that increased the building's height to more than 58'-4" [21]. The Erecting Shop was designed with fifteen concrete drop pits and three bays that had through tracks – serviced by two overhead cranes. The Machine, Tank (Boiler), and Blacksmith Shops were scheduled for outfitting with more than forty pieces of heavy machinery, and also were serviced by two overhead cranes.

Fifty-one drawings were produced for the Bellmead Shops; some presumably as early as 1921, because shop and erection drawings were being prepared in December 1922, by the Mt. Vernon Bridge Company in Mt. Vernon, Ohio, for structural steel components [22]. The architectural plans were in production until June 1922, although various revisions were made in February 1923. A change order was issued during this period for a fifty-foot extension to the Storage Building. The drawings were revised to incorporate the change in April 1923. The drawings were again revised in November 1923 and as late as January 1924, presumably, for the production of “asbuilts” [23].

Twenty-four drawings were prepared for a large Bellmead Power House in January 1923, and also revised as late as January 1924. The building was designed to provide electricity, steam, and compressed air for the new Bellmead Shops, as well as an old machine shop that was situated to the southwest of the Power House site and northeast of the existing roundhouse. On April 1, 1923, the MK&T Railway Company of Texas was dissolved by incorporation of the Missouri-Kansas-Texas Railroad Company of Texas. The title blocks of drawings prepared by the Office of the Chief Engineer after this date carried the new company name. The Bellmead Power House was also designed to be built of “fireproof construction” with brick walls, concrete floors, cement roof tiles, and a steel structure.

An indeterminate number of drawings were produced for an Oxygen-Acetylene House in addition to a Blacksmith Supply Building, Furnace House, Laundry, and Equipment Shed that were to be located on the north side of the Bellmead Shops [24]. However, none of the original drawings produced by the Office of the Chief Engineer survived. Area

specifications for “Shops and Locomotive Terminals” had indicated that: “Oxygen and Acetylene should be stored in a separate building of light frame construction, located not less than fifty feet from the main building” [25]. Bellmead’s Oxygen-Acetylene House exceeded the AREA specifications. It was planned to be built of masonry so that it could be classified as being of “fireproof construction,” and would supply oxygen and acetylene gases to overhead lines that ran throughout the Locomotive Shops. These lines supplied fuel for welding and cutting torches.

Construction of the Bellmead Locomotive Shops, Power House, and Acetylene-Oxygen House was started at an unknown date but completed by August 1923. Other buildings that were part of the Bellmead expansion that same year included additional ancillary structures such as Storage Sheds, a Paint Shop, and a small Emergency Hospital and Firehouse [26]. Unfortunately, valuation records indicating the costs of the Bellmead expansion were not located during the research investigations.

The Bellmead Locomotive Shops were constructed in a vernacular industrial style that was common for the period. The front (west) façade was divided into three bays by function and housed the Erecting and Flue Shops, the Machine and Electric Shops, and the Tank (Boiler) and Blacksmith Shops. Each bay was further subdivided into an additional three bays, defined by a system of alternating brick piers and steel window sash. The largest and most imposing edifice housed the Erecting and Flue Shops. It had masonry corner and intermediate piers with concrete bases. The intermediate piers framed a 13’-foot-wide entry that was fitted with steel entry doors that were glazed with steel sash. The doors were surmounted by steel window sash, which were erected to a height of more than 53’. The steel sash capped by a precast concrete lintel, a decorative brick panel in basket-weave pattern and the company’s name – “MKT” and “Missouri-Kansas-Texas Lines” placed within a shield that was cast in terra cotta, beneath three corbeled dentil courses that were surmounted by a precast concrete pediment. The bay’s masonry piers had precast concrete panels, decorative brick panels, and parapets that were capped with precast concrete coping. The design was repeated on the (east) rear facade [27].

The (west) front facades of the Machine, Tank, and Blacksmith Shops were lower in height. Like the Erecting and Flue shops, they had corner and intermediate masonry piers with concrete bases. The intermediate piers also framed 13’ entries that were fitted with steel doors that were glazed with steel sash, and the doors were surmounted by steel window sash. However, the steel sash were capped by decorative rowlock lintels, decorative brick panels, and precast concrete pediments. In addition, the monitors for these work areas created a sawtooth roof that was visible from the north, east, and west sides of the building [28].

The (north and south side) facades had nineteen bays of steel window sash, broken by vertical steel cover plates at the columns, above a low masonry wall with a precast

concrete sill. The end piers were of masonry construction and featured concrete bases and precast concrete caps. Concrete coping was used to trim a short masonry parapet that ran the length of these facades [29]. The (east) rear facade of the Locomotive Shops was broken by the two-story Locomotive Shop Office and one-story Storehouse buildings as well as a 67'-wide crane portal, covered by a red concrete tile hood (canopy) of similar width. The opening allowed a forty-ton overhead crane to travel on an elevated "crane runway over platform" that projected 100' from the building. Erected on steel "A-frame supports," the runway and crane rail was set at a height of 26'-4" [30].

The Locomotive Shop Office and Storehouse Buildings were dwarfed by the immensity of the north and south facades but appeared better massed when viewed from the (east) rear [31]. Built in the vernacular industrial style as the Locomotive Shops, the Locomotive Shop Office Building was four bays in length and two bays in depth and housed the Shop Superintendent's Office, the Timekeepers' and Clerks' Office, a file room and Manufacturing Tool Room. The Storehouse was two bays in length and depth. Both buildings featured masonry corner and intermediate piers

with concrete bases and precast concrete coping. Low masonry walls with precast concrete sills spanned the distance between the piers. These supported steel window sash with precast concrete lintels, and, at the one story Storehouse Building, a masonry parapet trimmed with precast concrete coping. The second floor of the Locomotive Shop Office Building repeated the design of the first floor with a second low masonry wall, precast concrete sill, steel sash, precast concrete lintel, and a masonry parapet trimmed with precast concrete coping. The principle entries for these buildings were located on the east facade, in the first bay of the Storehouse Building and the first and third bays of the Locomotive Shop Office Building. They were framed by masonry piers which had concrete bases, molded concrete capitals, precast concrete pediments, and were fitted with a pair of steel doors with steel sash. A secondary entry for the Storehouse building was located on the south facade. It had a canopy of red cement tile that provided cover for a single glazed and paneled door of "tubular" steel [32].

The Locker/Toilet Building provided an employees' entrance and housed a time clock and heating fan rooms. It was attached to the south (side) facade of the Locomotive Shops. Six-bays in length and one bay in width, the building has a more utilitarian appearance than the other buildings in the Bellmead Yard. The building had masonry exterior walls, was fenestrated with paired and single steel casements, and had a shed roof with six 12" ventilators [33]. The (west) front facade provided an employees' entrance that consisted of four doors covered by a horizontal awning and signage, which read: "Employees Entrance" along with individual signs marked with employee numbers 1-150, 151-300, 301-450, 451-600, [and] 601-750, respectively, above each consecutive door [34]. The doors were of "tubular" steel, glazed with six lights each, and had concrete thresholds [35]. The building

also contained 182 “White” and fourteen “Negro” lockers; thirty-two “White” and ten “Negro” toilets; and sixteen “White” and fourteen “Negro” lavatories – suggesting that roughly one-third of the workforce at the Bellmead Locomotive Shops were African-Americans [36].

The Bellmead Power House was constructed with masonry load-bearing walls, a steel structure, and was fenestrated with grouped and single steel casements. The building housed a Boiler Room and Compressor/ Generator Room, as well as a subterranean switchboard room and pipe tunnels. Furnished with a battery of oil-fired, 328-horsepower O’Brien Boilers, connected to Collins burners, and a 2,000 cubic foot motor-driven compressor, the Power House provided steam, compressed air and electrical power via a bank of transformers to the Bellmead Locomotive Shops, the old Roundhouse Machine Shops, and the Roundhouse [37]. Massed with both 2-1/2 and three-story volumes, the building was four bays in length and three bays in width. The functional importance of the building was evident in the vernacular industrial design of its principal (east) but rear facade. It had corner masonry piers with chamfered concrete bases, recessed and flush decorative masonry panels in herringbone pattern, and precast concrete caps which terminated in parapets that were trimmed with precast concrete coping. The intermediate piers had concrete bases and precast concrete caps. Low masonry walls with precast concrete sills spanned the distance between the piers. These supported steel window sash with precast concrete lintels, and a masonry parapet with flush decorative masonry panels in herringbone pattern [38].

The (west) front facade of the Compressor/Generator Room was divided by two pairs of engaged masonry pilasters which had concrete bases and precast concrete caps. The distance between the pilasters was spanned by low masonry walls and precast concrete piers. These supported steel window sash with rowlock lintels, another row of steel casements and rowlock lintels, and a masonry parapet with precast concrete coping. A pair of “tubular” steel entry doors was located in the first bay, glazed with four lights each. These were surmounted by steel casements. The three-story facade of the Boiler Room projected well above the west facade’s parapet. It had masonry end piers and intermediate piers, the former decorated with simple rowlock bands, alternating with ventilating louvers that were built of “transite asbestos wood” [39].

The (north and south) facades were of similar design and construction. The two-and-one-half story Compressor/Generator Room featured one engaged pilaster with a concrete base and precast concrete cap, and a low masonry parapet trimmed with precast concrete coping. It was fenestrated with steel sash and rowlock lintels. The three-story Boiler Room had masonry end piers and one engaged pilaster with concrete bases and precast concrete caps. The facade was fenestrated with single steel casements and featured rowlock lintels, rowlock and concrete bands, and precast concrete coping trimming a masonry parapet. “Tubular” steel sliding doors were located in the first and third bays of the north and south facades [40]. An arched “breach line opening” was provided in the north facade for access

to a board-formed concrete smokestack. Constructed to a height in excess of 100', the smokestack had a molded, decorative cap and the letters "M-K-T" cast into its east and west sides.

The Oxygen-Acetylene House, like the Locker/Toilet Building, was constructed in a utilitarian manner. Three bays in length and one bay in width, the building housed Oxygen Manifold, Carbide Storage, and Acetylene Generator Rooms. The building supplied two underground lines with oxygen and acetylene gases to risers in the north wall of the Tank and Blacksmith Shops. Oxygen, acetylene, and their respective vent lines were located overhead along the perimeter walls were installed to run east-west, at the column lines, along the length of each bay. Oxweld outlets were located at every other column, and in concrete lined, open air pits that were built at the southwest corner of the Flue Shop and on the south side of the Oxygen-Acetylene House. Both gases were also supplied to the old roundhouse and to a Blacksmith Supply House that was erected east of the building [41]. The Oxygen-Acetylene House had foundation walls of board-formed concrete and load-bearing masonry walls that were fenestrated with single steel casements and "tubular" steel doors that were glazed with four lights each.

The Bellmead Locomotive Shops opened for daily operations on August 14, 1923. Sometime after that date, two interior photographs were taken in the Erecting Shop. The images were recorded by a photographer who signed his name on the prints as "Gildersleeve," and who drove from nearby Waco to set up his camera equipment for the M-K-T. His first photograph was an especially dramatic one. It showed a G-8-A 4-6-0 locomotive suspended from a 180-ton Shaw crane, above the heads of six very confident members of management. Twenty-six other employees stood against the east wall, out of harm's way. Another locomotive, Pacific No. 365, sat idle, just inside the entrance to the Erection Shop. The second photograph Gildersleeve took was looking east. It recorded nine workmen standing in front of a number of locomotives already receiving repairs. The immensity of the building's 475'-long Erecting Shop was clearly evident from this image [42].

During their first three years of operations, the Bellmead Locomotive Shops were managed by Horace M. Warden, Superintendent. He also ran another large company facility, the Parsons Shops in Parsons, Kansas, during the same period. In 1927, Warden was appointed Chief Mechanical Engineer for the M-K-T and relocated to St. Louis, Missouri [43]. The work conducted at the Bellmead Locomotive Shops had been standardized by the railroad industry as early as 1909 and the entire process was described in detail by the American Railway Association, formerly the American Railway Master Mechanics Association, in its *Locomotive Cyclopedia of American Practice* in 1925. It stated:

An engine awaiting repairs is brought to [the] shop[s] and is thoroughly examined by boiler and machinery inspectors who report as to [its] condition. One copy of

this report goes to the supervisor of the shop schedules enabling him to define the classification of repairs needed and assign the proper schedule and number or working days required for completing repairs. The engine is next forwarded to the stripping pit where it is stripped and an itemized list of repairs needed is then forwarded by the pit inspectors to the supervisor of shop schedules who is then in a position to assign exact dates for completing all parts for delivery to the erecting shop in time to assemble the engine in the best practical and logical sequence of operations [44].

In the work of making repairs, the locomotive is first placed in the erecting shop and dismantled. First the main and side rods and parts of the valve motion which would interfere with the work are removed and then the wheels are removed; this is accomplished by lifting the boiler and its attached parts. In this operation overhead cranes are used. When the boiler is raised the wheels are rolled out or the boiler is moved to another [location]. . . All parts, such as the rigging, pistons, cross-heads and guides, valves, etc. are then stripped from the frame and cylinders and the driving boxes are removed from the axles. If a new firebox is required, the entire boiler is sent to the boiler shop where all parts which do not need repairs are stored until the boiler is ready for reassembling.

All parts requiring repairs are placed in a bath of hot water and lye and the grease and dirt removed. After being withdrawn from the lye bath, the parts are thoroughly washed and are then inspected and the repairs necessary to be made are noted. The number of the engine to which the different pieces belong is stamped on each part or a tin tag is attached to them so that they can be identified [45].

After the work of overhauling the engine is nearing completion and repairs to parts have been made, the truck and driving wheels are assembled over the pit and the boiler, with the spring rigging in place, is lowered on [to] them, the wheels being so placed that their boxes which have been previously attached to the axles will enter the frame jaws. The shoes and wedges are then put between the frame jaws and boxes and the pedestal braces bolted to the frames. The wedges are then adjusted to take up any play between the box and jaws and the accuracy with which the frame shoes have been fitted, tested by measuring with a tram the distance between the wheel-centers on both sides of the engine. . .

The pistons are [then] placed in the cylinders and keyed to the cross-heads and the valve mechanism coupled together. The main rods are then put up and the valves are then set and the side rods erected. The various cab fittings that may have been removed [during] the overhauling are replaced and the entire job given a thorough inspection and the operation of various parts tested. The machine is then relayed for "breaking in" and then placed in regular service [46].

The Bellmead Shops included in one facility an Erecting Shop, a Flue Shop, a Machine and Electric Shop, as well as Blacksmith and Tank (Boiler) Shops [47]. Locomotive repairs were described by a contemporary manual as “requiring the use of many types of [heavy] machinery and the services of many different classes of mechanics [including] machinists, boiler makers, blacksmiths, etc.” [48]. The inherent dangers of heavy equipment operation in a confined –though-immense – space prompted the decision on the part of management, presumably during the 1930s, to attach the following signage to two Shaw cranes in letters large enough so that they would be plainly visible from the Erecting and Flue Shop floors, some 42’ below. The first sign was located to the left of the Shaw emblem and tonnage rating for a 180-ton electric traveling crane. It encouraged workers to:

LEARN YOUR A-B-Cs
ALL WAYS [sic]
BE CAREFULL [sic]

The second sign was located on the right hand side of the Shaw emblem and tonnage rating. It read:

PUBLIC SAFETY
BEGINS WITH YOU
!!DO YOUR PART!!

The same messages were placed on either side of the Shaw emblem and tonnage rating for the forty-ton crane, which traveled directly beneath the 180-ton unit, but the signage order was reversed. When asked whether there were any accidents in the Bellmead Shops, one former “Katy” employee, Burt Davidson, Jr., responded, “I don’t know of any personally, but I’m sure there were. When you have that many people working around heavy equipment, there has to be at least a smashed finger or two everyday” [49].

At the height of its operations, Bellmead Yard employed a large workforce at a facility that was referred to in the vernacular as “closed shops.” Davidson stated that, “about 700 to 800 [employees worked there] when we [were] building engines. . . There were three shifts in the yard. About every eight hours-12:59, 7:59, and 3:59—[the shifts were changed]. The shops only worked one shift – the daytime shift” [50].

African-American men and some Anglo women were also employed by the “Katy” the Locomotive Shops. The African-American workers were provided with what Davidson described as “separate lockers, restrooms, everything. Some of them [were] ‘wipers’ – polished the cars and the wheels. Others [were] ‘fire builders.’ They’d look in the boiler[s] to see if there [were] any bowed pieces that needed repair[s]. They [also] used . . . air hammer[s] mostly on the bolts and they’d restoke the fire[s] when the train[s] were ready to go” [51]. Another former “Katy” employee, Tommy Evans, said that many

African-American “workers were laborers. . .helpers. They [assisted] the journeymen [from the shops’ opening] until after World War II. However, none of the electricians, machinists, or engineers were Black” [52].

Davidson said:

The only women [at Bellmead] were in the back shop office by the ‘Rip Track.’ Some of them [were] ‘callers.’ They called the crew[s] to go out at a certain time. The men [that] they called had an hour and a half to get ready. [This included] an Engineer, Fireman, Head Brakeman, Rear Brakeman, and a Conductor. [Today] the[se] jobs. . .only have two men – an Engineer and a Conductor. But back then, there was a lot of work [to do] because there was fueling, watering, and putting sand in the ‘sanders’ to keep the wheels from slipping [53].

Evans said that the only women employed at Bellmead worked “as office help, like secretaries.” During World War II, “women [also] worked as ‘callers’ because there was a lack of men” [54]. Davidson stated that all of Bellmead’s employees were trade union members. “You were a union worker or you just didn’t work. They called [Bellmead] ‘closed shops.’ That meant [that] if you didn’t belong to a union, you couldn’t think about working. All the unions were different, though. Car men, Engineers, Conductors – every [category of employee had a different] union [55].

Evans said:

[his] father was in management so he wasn’t in a union. But everyone else was. The electricians belonged to the International Brotherhood of Electrical Workers. The machinists belonged to the International Association of Machinists. The engineers belonged to the Brotherhood of Locomotive Engineers. And there was [also] the United Transportation Union (UTU). There [were] more, but I can’t remember all of them. Unionizing started back in the Roosevelt Era, sometime during the late ’30s or early ’40s [56].

Asked how many locomotives were repaired at the Bellmead Shops each day, Davidson said there could be as many as “ten or twelve passenger and about ten or twelve freight jobs [that] came between Smithfield and [Waco] from the Houston area. However many trains came through [each] day, that’s how many trains got some kind of service, whether it was fueling or restoking or whatever. I can’t tell you [how many] exactly [because the number of trains] varied” [57].

In 1944, Katy President, Matthew Sloan, rededicated the Bellmead shops as the Warden Shops, in honor of Horace M. Warden’s accomplishments for the carrier, which one historian described as including the, I&O “conservative motive power policies, its fuel

economy, and its high motive power availability” [58]. The following year, Warden was appointed Vice President and General Manager for the entire company. Former “Katy” employee Evans stated: “[In] 1947 most of the [steam locomotives] were sent to a reclamation plant in Parsons, Kansas, and then the parts were sent anywhere they were needed [59]. The Warden Shops were converted to diesel maintenance and repair shops by 1948.

In August of that year, a site plan of the Bellmead Yard was produced in the Office of the Chief Engineer in St. Louis, Missouri, and titled, “Diesel Engine and Train Facilities at Bellmead Yard.” The drawing showed the Car Foreman’s Office, which was labeled “Car Department Office & Locker Room” at its current location in the yard. The Car Foreman’s Office was erected at an unknown site and at an indeterminate date, probably in the 1930s, and moved to the Bellmead Yard, presumably during World War II. Constructed in the Craftsman Style, the building was five bays in length, one bay in width, and one story in height.

The Bellmead Roundhouse that was built in the first decade of the twentieth century was damaged during a severe wind storm in 1951. It was photographed from the air along with the entire site by unknown photographer the following year. The image showed that the roundhouse had lost large portions of its roof [60]. The building was presumably razed sometime shortly thereafter. The photograph also showed that the Warden Shops had remained relatively unchanged since their construction in 1923. Drawings were prepared in February 1953 by the Office of the Chief Engineer for a small alteration to the Erecting Shops. It provided for the construction of one new diesel inspection pit between two existing diesel pits [61].

The Warden Shops were closed permanently as a cost-saving measure sometime after 1955. Evans remarked: “They [eventually] closed the [Bellmead] shops and [the shops] in Parsons and transferred everything to a shop [that the company] had in Fort Worth. Some of the employees were transferred, too” [62]. Davidson added: “They moved part of the Warden Shop operations to Denison and another part to Kansas City [before that]” [63]. The Warden Shops remained vacant until the late 1960s. M-K-T was approached by the A.O. Smith Company of Wisconsin to convert the facility into a plant for the production of 150-pound bomb casings for the Vietnam War.

Evans recalled of the period:

A.O. Smith was the company that came in there. They were based in Wisconsin. They made other stuff like water heaters [and] boilers. But they converted the shop[s] into a bomb-making plant in the late [19]60s. They were there for a couple of years. I would say from 1967 to 1969. There were around 400 employees who worked there. It was mixed – men and women. Mostly men worked there. . .but there were some women [64].

Davidson indicated that in retooling for a shell-casing factory, the company removed all of the original equipment for sale as scrap. He said, "Airmen, Boiler men, Wheel men – all of them were in different areas in the shop. A.O. Smith Dust [just] tore all that stuff out" [65]. After the company ceased operations, the Warden Locomotive Shops, the Bellmead Power House, and the Oxygen-Acetylene House were left empty and abandoned. They remained in that condition well into the late twentieth century. The Car Foreman's Office, however, was occupied when field work was conducted at the site in 1997.

PART II. ENDNOTES

1. Collias and George 1986: 7.
2. Ibid.
3. Ibid.
4. Ibid.: 8.
5. Ibid.: 11-13.
6. Ibid.: 13.
7. Ibid.
8. Ibid.: 14
9. Ibid.:15
10. Ibid.: 14-22.
11. Ibid.: 23.
12. Ibid.
13. *Manual of the American Association for Railway Engineering* 1929: 1471.
14. Ibid.: 1472.
15. Ibid.: 1473.
16. Ibid.: 1475.

17. Ibid.: 1476.
18. Ibid.: 1474.
19. Ibid.
20. Drawing Nos. E4 & E5, "Side Elevations - Framing & Girts"; "End Elevations - Framing & Gifts." Mt. Vernon Bridge Company. Mt. Vernon, Ohio. 1922.
21. Ibid.
22. Ibid.
23. Various Engineering Drawings, Office of the Chief Engineer, MK&T Railway of Texas and M-K-T Railroad Company of Texas. St. Louis, Missouri. 1922-1924.
24. Drawing No. 14 of 51, "Bellmead" Locomotive Shop[s], Plan and Cross Section.
25. *Manual of the American Railway Engineering Association* 1929: 1,488.
26. Drawing No. 18 of 24, "Bellmead Power House, General Layout of Power Transformers and Wiring." Office of the Chief Engineer, MK&T Railway of Texas. St. Louis, Missouri. Drawn 1923, revised 1924.
27. Drawing Nos. 16 & 17 of 51, "Bellmead Locomotive Shop[s], Detail of End Wall." Office of the Chief Engineer, MK&T Railway of Texas. St. Louis, Missouri. Drawn 1922, revised 1923.
28. Ibid.
29. Drawing No. 15 of 51, "Bellmead Locomotive Shop[s], Elevations." Office of the Chief Engineer, MK&T, Railway of Texas. St. Louis, Missouri. Drawn 1922, revised 1923.
30. Drawing Nos. 10 & 11 of 51, "Bellmead Locomotive Shop[s]-East End Elevation" and "A Frame Supports for Crane Runway Extension." Office of the Chief Engineer, MK&T Railway of Texas. St. Louis, Missouri. Drawn 1922, revised 1923.
31. Ibid.
32. Drawing Nos. 24, 24A, & 26 of 51, "Bellmead Locomotive Shop[s], Storeroom Floor Plans, Elevations; Elevations, Floor Plans and Sections; Elevation of Door, Section Thru Doorway." Office of the Chief Engineer, MK&T Railway of Texas. St. Louis, Missouri. Drawn 1922, revised 1923.

33. Drawing Nos. 27 of 51 "Bellmead Locomotive Shops[s], Plan, Elevations, Sections, [and] Details of Building for Toilets, Lockers, and Fan Room No. 1." Office of the Chief Engineer, MK&T Railway of Texas. St. Louis, Missouri. Drawn 1922, revised 1923.
34. Drawing No. 36 of 51, "Bellmead Locomotive Shop[s], Time Clock Room, Plan, Elevations, Sections, Details." Office of the Chief Engineer, MK&T Railway of Texas. St. Louis, Missouri. Drawn 1922, revised 1923.
35. Ibid.
36. Drawing No. 27 of 51, "Bellmead Locomotive Shop[s], Plan, Elevations, Sections, [and] Details of Building for Toilets, Lockers, and Fan Room No. 1." Office of the Chief Engineer, MK&T Railway of Texas. St. Louis, Missouri. Drawn 1922, revised 1923.
37. Drawing Nos. 14 & 18 of 24, "Bellmead Power House, Cross Section Showing Boiler, Air Compressor, Piping and Switchboard; General Layout of Power Transformers and Lighting," Office of the Chief Engineer, MK&T Railway of Texas. St. Louis, Missouri. Drawn 1923, revised 1923, 1924.
38. Drawing No. 4 of 24, "Bellmead Power House, Elevations, Details." Office of the Chief Engineer, MK&T Railway of Texas. St. Louis, Missouri. Drawn 1923, revised 1924.
39. Drawing No. 4 of 24, "Bellmead Power House, Elevations, Details." Office of the Chief Engineer, MK&T Railway of Texas. St. Louis, Missouri. Drawn 1923, revised 1924.
40. Ibid.
41. Drawing No. 31 of 51, "Bellmead Locomotive Shop[s], Oxweld and Lighting Plan," Office of the Chief Engineer, MK&T Railway of Texas. St. Louis, Missouri. Drawn 1923, revised 1924).
42. Collias and George 1986: 34.
43. Ibid.: 35.
44. *Locomotive Cyclopedia of American Practice* 1925: 1043.
45. Ibid.: 1039.
46. Ibid.: 1040.
47. Drawing No. 14 of 51, "Bellmead Power House, Cross Section Showing Boiler, Air Compressor, Piping and Switchboard." Office of the Chief Engineer, MK&T Railway of

Texas. St. Louis, Missouri. Drawn 1922, revised 1923.

48. *Locomotive Cyclopedia of American Practice* 1925: 1039.
49. Davidson 1997: personal communication.
50. Ibid.
51. Ibid.
52. Evans 1997: personal communication.
53. Davidson 1997: personal communication.
54. Evans 1997: personal communication.
55. Davidson 1997: personal communication.
56. Evans 1997: personal communication.
57. Davidson 1997: personal communication.
58. Collias and George 1986:34.
59. Evans 1997: personal communication.
60. "Inside Diesel Inspection Pit." Office of the Chief Engineer, Missouri-Kansas-Texas Railroad Company of Texas. St. Louis, Missouri. 1953.
61. Collias and George 1986: 36.
62. Evans 1997: personal communication.
63. Davidson 1997: personal communication.
64. Evans 1997: personal communication.
65. Davidson 1997: personal communication.

PART III: SOURCES OF INFORMATION

1. Original Engineering Drawings: Microfilm copies of 63 original engineering drawings in aperture cards were located during the research investigations in the UP (former SP) archives in Topeka, Kansas. The microfilm images were digitally scanned and printed. They include the following: Office of the Chief Engineer, Missouri, Kansas & Texas Railway of Texas, 57 drawings (drawn 1922, revised 1923; drawn 1923, revised 1924); Mt. Vernon Bridge Company, 2 drawings (drawn 1922, revised 1923); Office of the Chief Engineer, Missouri-Kansas-Texas Railroad Company of Texas, 4 drawings (1953).

2. Early Views: Three early views were located during the research investigations. They include an aerial view of the Bellmead Yard (1952), and two views of the interior of the Bellmead Shops taken shortly after the facility's opening (1923). (See photographic documentation HAER TX-74- 05 as well as HAER TX-74-A-14 and HAER TX-74-A-15). The early views were located at the end of the research investigations and are positioned accordingly.

1. Interviews:

Davidson Jr., Burt. Telephone interview with Rosa Clipper-Fleming. Typewritten transcriptions. Waco, Texas. 15 November, 15 December 1997.

Evans, Tommy. Telephone interview with Rosa Clipper-Fleming. Typewritten transcriptions. Waco, Texas. 17 November, 15 December 1997.

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a. Primary and unpublished sources:

Office of the Chief Engineer, MKT Railway Company of Texas, St. Louis, Missouri. Area Map. 1943.

b. Secondary and published sources:

American Railway Association. *Locomotive Cyclopedia of American Practice*. Simmons-Boardman Publishing Company. New York, New York. 1925.

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Collias, Joe and Raymond George, Jr. *Katy Power. Locomotives and Trains of the Missouri-Kansas-Texas Railroad (1912-1985)*. MMBooks. Crestwood, Missouri. 1986.

Reed, S.G. *A History of Texas Railroads*. St. Clair Publishing Company. Houston, Texas. 1941.

Zlatkovich, Charles P. *Texas Railroads: A Record of Construction and Abandonment*. Bureau of Business Research. University of Texas at Austin. Austin, Texas. 1981.

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