LANDMARKS
ASSOCIATION OF ST.LOUIS INC.

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FINAL REPORT - NORTH BROADWAY INDUSTRIAL AREA - PHASE II

OBJECTIVES

The growth and success of the city of St. Louis has historically been closely linked to the Mississippi River. The Chouteau's Landing Survey and Phase I of the North Broadway Industrial Survey both clearly illustrated the density of industry near the downtown riverfront. The dates of the buildings that remain and the use of the 1875 Compton and Dry Pictorial History of St. Louis and the 1883 Hopkins map begin to give a fairly clear indication of settlement patterns along the river after the Civil War. Industry located near the water and near the freight lines, while residences and retail commerce was gradually pushed to the west. Gradually, only a few hardy souls still desired to maintain residences in the midst of the noise and pollution generated by the riverfront industry through much of this century. The desirability of a riverfront location for many industries has lessened as overland trucking has become a commercial mainstay in transportation in this country. Still, the riverfront industrial strip remains critical to the economic health of the city and the entire metropolitan area; the city is, in fact a hub of commerce and industry over a sizeable Midwestern hinterland, particularly for specialized goods and services that are not available in every town. The objectives of this survey were to identify those buildings in the survey area built prior to c. 1940 which appear to maintain their integrity, and to evaluate them as to their eligibility for listing in the National Register of Historic Places. Phase II of the North Broadway Industrial Survey extends north from Clinton Street (the northern boundary of Phase I), and parts of this survey area are located substantial distances from the downtown center. It is thus expected that the buildings will decrease in density as one moves northward, away from the oldest established commercial part of the city. Transportation, in the form of rail lines, roads and water access, are as readily available in this part of the city, so the bulk of the buildings can be expected to be of an industrial or commercial nature.

AREA SURVEYED

[Note: The survey area is narrow and long and, to facilitate ease of perusal, the map for it has been divided into three separate smaller maps.] The survey area is as follows: beginning at the point of intersection of the west bank of the Mississippi River and the north line of Clinton Street, continuing westwardly to its point of intersection with the east line of North Tenth Street; running northwardly along North Tenth Street to its point of intersection with the north line of St. Louis Avenue; thence westwardly to its point of intersection with the east line of the Mark Twain Expressway (Highway

70); thence northwardly along said highway line and northeastwardly down the North Ninth Street exit ramp to its point of intersection with the east line of North Ninth Street and its projection; thence northwardly along the east line of North Ninth Street, crossing City Block 1228, to its point of intersection with the projection of a line that runs parallel to and approximately 200' from Ferry Street; thence eastwardly along said paralleling line to its point of intersection with the west bank of the Mississippi River. This survey encompasses the land bound by the Mississippi River on the east, Clinton Street on the south, Highway 70 on the west, and Ferry Street on the north (including the buildings on the north side of Ferry facing the street). The area originally extended westward from the river in an uninterrupted expanse, but was truncated by the construction of the highway in the 1960s and 1970s. Less revitalization of and interest in this area have occured than in the riverfront neighborhoods to the south. The distance from the tourism-generating Laclede's Landing and the proposed St. Louis Harbor, coupled with a lack of accessible riverfront streets and a less densely-built riverside, have kept those interested in potential ambiance away. Much of this area is a "no man's land," with rutted roads impassable (or nearly so) by the average automobile. Railroad tracks account for much of the poor shape of the roads, crossing all of the east-west streets east of Broadway in several places. Large freight trucks provide the bulk of the traffic east of Broadway and also cause a good deal of the bad road problem. Because they have no difficulty negotiating deep ruts and holes, there is apparently no push to repair these streets. Additionally, much of the real estate east of Broadway in this survey area cannot be reached, simply because the roads are actually closed to the public with gates or barriers. The survey area covers approximately 525 acres.

RESEARCH DESIGN AND METHODS USED

This study began with a windshield survey, noting demolitions, new construction, changes in existing buildings, and road accessibility. The archives at City Hall, Market and Tucker Streets, were then consulted to obtain information available on microfilmed building permits. The permits are arranged by city block number, more or less chronologically. As with any building permit search in St. Louis involving early buildings, the problem arises wherein a pre-address permit lists only the street name and the side of the street the building was to be built on. This can sometimes be solved by the process of elimination (the permit usually gives the number of stories and the general use of the building, such as "dwelling" or "store"). City directories or other archival information in which the owner's name can be matched with a known location can also prove helpful in this situation. Often, these early permits (before c. 1880) cannot be positively correlated to an existing building. Every effort was made to obtain an exact building date for every building surveyed. As compared to the Chouteau's Landing and North Broadway Industrial I surveys, there are relatively fewer permits per city block. This is probably attributable to a slower turnover of businesses than was found to the south where property expenses and general overhead were higher,

and to the fact that people were probably less concerned with taking out building permits than those in higher-visibility areas closer to downtown. Two sources most often used in the dating of these earlier buildings were the 1875 Compton & Dry hand-drawn perspective view of St. Louis and the 1883 map by Hopkins, which shows the outline of each structure (and the building material, on the colored original); copies of both are included with this survey. Those buildings that eluded dating by conventional and deductive means were assigned circa dates based on comparison with similar, dated buildings nearby, their physical aspect, and/or their appearance on the early maps or drawings. The deductive process of dating these particular buildings (usually dwellings) is outlined in Item #32 of the survey sheets. The quality and availablity of the building permits for this area was about average for St. Louis; some blocks were poorly recorded while others appeared to be fairly complete. A certain percentage of missing permits, informational gaps and conflicting or confusing information can always be expected.

Once the building permit research was done, the information was taken to the Main St. Louis Public Library, where the St. Louis Daily Record is available on microfilm. The Daily Record lists every legal transaction in the city, including building and demolition permits. The building permits as available to the public today are really typed copies made by the WPA during the 1930s and later microfilmed; they did not often record architects, contractors, size or other vital information about a building. Additionally, the transcription process from hand-written originals was often faulty. The complete building information is recorded in the Daily Record. Occasionally, entries for permits cannot be located in the Daily Record (usually due to a mistyped date on the permit); thus, sometimes even relatively recent permits have no verifiable architects or builders. In this survey area, a fairly high number of seemingly complete Daily Record entries failed to list an architect or builder; this is probably due to the large number of owner-designed and -built buildings. Also, the Daily Record unfortunately did not begin publication in St. Louis until October of 1890, precluding its use for those elusive earlier buildings. This means that only exceptional buildings (or occasional anomalies that included the architect on the permit) built before 1890 received enough public notice that we are able to discover the architect today. It should be noted here that a number of rolls of Daily Record microfilm are currently unavailable.

A photograph was next taken of every building in the survey area not obviously new or completely devoid of integrity. This last assessment can be a matter of personal interpretation, particularly in cases of well-meaning residential owners; a serious outbreak of permastone coverage had been rampant in parts of this survey area. In some permastone cases, it was perfectly possible to see all the original architectural detailing, while in others it was not. Very few storefronts in this area have gone unaltered, and quite a number of commercial buildings have undergone complete re-facing jobs. An attempt was made to be judicious in these cases, particularly if any

redeeming architectural value, even if on a side elevation, could be seen. So much demolition has gone on in this area that it seemed best to record everything that had some value left.

Buildings were next assigned survey numbers, beginning in the southwest quadrant and moving north using a west-to-east, block-by-block pattern. Those buildings on the maps designated with an asterisk are generally either newer than 1940-2, or are devoid of integrity in the researchers' estimation; this should not be confused with the "non-contributing" status often seen in National Register district nominations. The problem of multiple buildings that presently form a single building or complex of buildings was met by using the same system used for North Broadway Industrial I. Each separate unit was assigned its own survey number in cases where the researchers felt that they were originally disparate units rather than just additions; there are a few cases in which two buildings are counted as one because they essentially look and function as one. Additions to buildings are mentioned within the discussions in Items 31 and 32 as appropriate. The survey yielded a total of 166 numbered properties.

After the basic data and photographs were done for the buildings, an attempt was made to locate information about the original company or individual owner as well as a rough history of the use of the building. The business sections of city directories, including helpful advertisements, and city histories of several types were consulted in this phase of the research. It was discovered that, as with North Broadway Industrial I, the majority of the businesses received no mention in the city histories, and neither were their owners often written up in biography books of leading citizens. The reverse city directories are no longer as accessible to the public as they once were, and so received minimal use. Another map, the Whipple Insurance map, was originally published in 1897 and updated after the turn of the century; it proved most helpful in surveys prior to North Broadway Industrial I but is unavailable to us now. The base maps provided here were drawn using a Sanborn Insurance map. The Sanborn shows building materials, unusual structural details, height, and occasionally gives a building construction date.

RESULTS

Immediately adjoining the North Broadway Industrial Area Survey - Phase I on the north, Phase II is in the midst of the industrial strip that extends upriver past the city limits at Riverview. Beginning at an arbitrary line of demarcation, Phase II begins with a composition much like Phase I: mostly heavier industries nearer the river, light industry and (usually wholesale) commerce approaching Broadway from the east, and a mix of commercial and residential buildings with some light industry west of Broadway. This proportion appears to be fairly standard along the approximately twenty miles of St. Louis' shoreline, but the density varies. In the south portion of the Phase I area, commercial and industrial buildings are built right down to the levee. As one travels northward, the trend is to allow more space between the

buildings and the water, and the industrial buildings rapidly thin out nearer the river. This shift away from the building density seen in the eastern parts of the first two industrial surveys is perhaps the most marked difference of Phase II. This difference is clearly historical; although there has been a great deal of demolition in all of the Phase II area, a look at the Compton & Dry and Hopkins maps shows that between North Market and Penrose (formerly Augusta) from the river to First (Main) Street, there have been few buildings since at least 1875. The bulk of the area has been and currently is used for lumberyards and railyards (and, formerly, stockyards), with a number of large tracts privately owned and kept relatively empty. Such businesses as lumberyards require a good deal of acreage, a need that was not feasibly met in the districts closer to downtown where real estate prices were at a premium even in the early days of the city.

The other early requirement of lumberyards was proximity to the water. Logs were often conveyed by the most elemental means: tied together in rafts (see shoreline shown in Compton & Dry). White pine from Wisconsin and Minnesota were always brought down the river in this fashion until, as written around the turn of the century, "the days of rafting lumber are numbered, as timber in the north is getting more and more scarce."[1] More plentiful yellow pine from the South began to be substituted for the white, necessitating overland shipping. The importance of the river to industry has remained generally high, but the use of the river for trade and travel had peaked by the 1860s, edged out by the railroads that first began to operate in the mid-1850s.[2] Shipment by rail, in fact, had become the norm by the mid-1870s, and is today supplemented by truck and barge lines. All of these means now find ready access in the N. Broadway industrial strip; the construction of Highway 70 has been a boon to industrial shipping here, although it may be argued that the loss of neighborhood buildings and cohesion and the resulting "other side of the tracks" feeling that residents here have was not worth the price.

East of North Broadway, railroad tracks are pervasive throughout the Phase II area; this is a longtime characteristic of the area, illustrated by Compton & Dry. In 1875, the area already had one of the highest ratios of feet of railroad track per acre (excepting the railyards west of Union Station) in the city. The establishment of these lines was important in later development as industry owners and merchants, in an effort to reduce drayage and handling costs, began to run private spurs up to and sometimes into their factories and warehouses. Examples of private spurs can be seen on the survey maps in virtually every city block east of North Broadway, and unlike the Phase I area, the majority of these appear to be in use; train traffic here is heavy. The first rail line into the North Broadway area was the St. Louis, Kansas City & Northern Railway, whose freight depot (razed) was located on North Market between First (Main) and Second (has a number 14 on it in the Compton & Dry view). Their multitrack yard took up much of several city blocks between North Broadway and the river. The St. Louis, Kansas City and Northern Railway was known as the North Missouri until 1871, and it ran from St. Louis to Ottumwa, Iowa with a branch to Kansas City.[3] After 1871, new management

reorganized the railroad, building an iron bridge across the Missouri at St. Charles and laying track at a rapid rate. The company later merged with others to become the Wabash line west of the river. The growth of this company paralleled that of a number of other new railroads, many of which used the North Broadway corridor to access industry. The tracks from the Merchants (Railroad) Bridge (1889) led from the bridge to Seventh Street to the levee and along the levee to Carr Street, north along First and Hall Streets to Bremen. Although the construction and subsequent sale of the bridge (during the Financial Panic of 1893) were met with public derision, the bridge and tracks have always been put to heavy use and doubtless contributed much to propelling St. Louis to considerable economic success during the early years of this century.

Aside from the predominating lumberyards and associated businesses like the Crescent Planing Mill (#73) and Charles Naber's Sons building materials and planing mill business (#119), there was a wide mix of types of business, ranging from chemical companies (Mallinckrodt [#115], Du Pont [#164], Grasselli [#163-4]) to farming implements (Oliver [#24], Deere [#4, 5], Parlin & Orendorff [#23]). This substantial diversity was fortunate for the economic well-being of the area, because it wasn't dependent on any one large employer. The citywide westward shift during the late 19th century seems to have been felt less here, since there were fewer consumer-oriented businesses in operation here than in the earlier areas surveyed. Fewer store/dwellings appear to have survived than exist in the earlier surveys; it is not known whether there were fewer of these to begin with, or if they were simply razed more often. The area altogether appears to have remained more a stable industrial/commercial mix than the earlier two survey areas, simply because it lacked to some clear extent the integration of dwellings with industry and commerce.

Unlike the industrial areas to the south, the North Broadway II area never had much density of dwellings east of Second Street. The enclave at Second and Angelica is the major exception (see Compton & Dry). There was no need, then, for the exodus of people moving out as industry moved in that was typical in the other areas. There were some early residential and mixed residential/commercial strips between North Broadway and Second Street, and these have virtually all disappeared; #137 (217-33 Bremen) and #157-161 and #165 (see Penrose, Ferry and Second) are the exceptions. The biggest blow to residences came, of course, in the 1960s and 1970s when the highway and its accompanying large-scale demolition came through, ripping the residential neighborhood west of North Broadway apart.

ARCHITECTURE

Much like the architecture of Chouteau's Landing and North Broadway I, that of North Broadway II varies widely in age and style, ranging in age from a mid/late 19th century vernacular dwelling (#161) to an Art Deco commercial building across the street (#163). Many of the buildings are simple boxes, strictly functional; others, like #32 (A.

B. Groves) were designed to make a statement about the company within the building. More frame buildings are included in this survey than the others, probably because in the more outlying areas it was possible to get away with building frame buildings at a later date.

Like the earlier surveys, the newer buildings tend to be strictly functional, often constructed of a frame with metal siding. Many are concrete block. Those starred on the map due to a loss of integrity have been transformed almost completely, often with the extensive use of corrugated fiberglas or metal or, again, concrete block.

Part of this survey area (Map 1 and Map 2 to about Dock) is included in the U.S. Army Corps of Engineers' proposed St. Louis Harbor Development Project, a plan that included making the riverfront area into a pleasure marina and making the nearby streets into a tourist-oriented area of shops and restaurants. This plan was proposed some years ago and was tabled until about a year ago due to lack of funding. The project is possibly being reevaluated. Although quite a bit of demolition in the North Broadway I area resulted from the initial announcement of this project, it appears that this area is a bit too far upriver for such drastic measures at this early date, so no real impact has been seen here so far. Should the plan be implemented to its full extent, a loss of density and character of the area would probably result.

Insofar as recommendations for potential National Register nominations go, there are certainly many potential candidates within all three areas of the industrial survey. Several of the large architect-designed industrial/commercial buildings, such as #22-24 and #32-33 of the phase just completed, are certainly worth investigation for single site nominations.

The industrial areas surveyed in this three-phase study would be rather unwieldy in a spatial sense if one were to try to designate a single district geographically using the entire strip. Some serious questions of density and too many infill buildings are sure to arise, particularly if the district were to extend the entire distance north. All three survey areas have many non-eligible buildings within their boundaries. Such a district would be heavily weighted with industrial buildings, followed by commercial and finally residential; this could pose potential nomination-writing problems, unless one were to draw the north-south boundary down the west side of North Broadway, effectively cutting out most of the residential buildings. This would be a shame, because some of the oldest housing left in St. Louis is located between the highway and North Broadway, and their counterparts across the highway are for the most part already listed in National Register districts like the Murphy Blair and Columbia Brewery districts in the north half and the Lasalle and Soulard districts in the south half.

If we were to divide up the entire industrial strip to create a geographical district, the most likely candidate for listing is definitely the Chouteau's Landing survey area. It has good density and

a higher percentage of older buildings still well maintained. It has a more even commercial/industrial/residential mix. It also is a manageable, cohesive area. Another district could perhaps be outlined in the North Broadway I survey area in the segments where there is enough density and less infill. A strip down both sides of North Broadway for much of the North Broadway Phase II area is a third potential district area.

Alternatively, a National Register district could probably be worked out using the Multiple Property Type form. This would possibly work best in the North Broadway I & II areas where a great deal of demolition and infill has gone on and in which many of the buildings that qualify as old enough would not qualify otherwise. The potential problem with this method is that establishing building types according to function is a very risky kind of selection process: it is not always possible for us to know the original function of a building. Also, there are certain utilitarian industrial buildings that could have had any one of several functions; we cannot know by the design which of these functions it had or has. Still, the Multiple Property Type nomination is the more logical of the two choices for the two North Broadway areas, and it has the advantage of allowing us to nominate other buildings from other areas at a later date.

There are definitely many potential National Register listings within the three survey areas; the best method of going about organizing a nomination or nominations depends on the resources of the preparers and on the type of district(s) the State Office of Historic Preservation feels should be nominated.

PHOTOGRAPHS - NORTH BROADWAY INDUSTRIAL AREA SURVEY - PHASE II

Photographs were taken by Cynthia H. Longwisch; negatives are in possession of Landmarks Association of St. Louis, Inc., 917 Locust, St. Louis, MO 63101.

All other information is on the photos.

1. Ernest D. Kargau, Mercantile, Industrial and Professional St. Louis (St. Louis: Nixon-Jones Printing Co. [1902-03], p. 236.

2. Ibid., p. 32.

3. J. A. Dacus and James W. Buel, A Tour of St. Louis; or the Inside Life of a Great City (St. Louis: Western Publishing Company, 1878), p. 164.

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FINAL REPORT/PROPERTY TYPE ANALYSIS FOR PHASES I, II, AND III OF LANDMARKS ASSOCIATION'S INDUSTRIAL SURVEY OF THE ST.LOUIS RIVERFRONT

More than any other building type, industrial buildings are governed by two primary design considerations: fireproof qualities, and functional requirements. Although style or aesthetic concerns may be aspects of industrial design, the conditions surrounding the uses of industrial structures take precedence and determine the design and ultimate success of the building.

Encouraged by insurance companies and industrial proprietors who desired strong, fire resistant structures, capable of withstanding unusally heavy loads of machinery and product, engineers experimented with new materials (such as concrete and steel), and discovered new uses of old materials (glass and iron). Many of the technological advances which became part of the 19th and 20th century programs of the tall commercial building originated in attempts of industrial designers to create a more fireproof factory building. Thus the iron frame was first developed in late 18th century England to deter factory conflagration; similarly, slow-burning mill construction, and finally reinforced concrete were both developed to improve upon the fireproof conditions.

The often severely plain, unornamented exterior design of the industrial building type was, in a sense, an expression of its primary function --to serve as a safe, economical, efficient shelter for some phase of industrial process. Eighteenth century architectural treatises, in fact, support 19th century practice. Writing in 1771 Blondel, for example, offered that factories should "look simple and solid and that they should be built on the periphery of a town by a river." While some 19th century theorists decried the "dis-beautifying" effect of factories in the English countryside, the English and American industrial building nonetheless remained largely impervious to Victorian stylistic pressures. Removed as most were from the town or city center, American industrial buildings were less subject to civic requirements of an architectural "image" demanding conventional stylistic decorum. As industrial historian Reyner Banham remarked, contrary to traditional notions of good design, the monotonous "panorama of row upon superimposed row of regular lighted windows, under the smoke belching merrily from hundreds of smokestacks" provided instead a new image of prosperity (because everyone was working) Fig.#1

Landmarks Association's three-phased industrial survey of the St.Louis riverfront covered approximately 855 square acres, and inventoried a total of 346 buildings, not all of which, however, were associated with industrial uses but included buildings which were residential, commercial/residential and some devoted to other specialized functions. A review of recent literature published on industrial buildings suggests two overlapping approaches to the development of a "Property Type" classification system for the industrial properties in Landmarks survey. The first approach differentiates industrial buildings by

virtue of their materials and methods of construction, while the second approach classifies on the basis of specialized function.

1. FACTORY

In Nikolaus Pevsner's book, A History of Building Types (Princeton Univ. Press, 1976) the factory is treated as a distinct building type (Chapter 17). The author defines factory as a building "of some size in which products are made in some quantity", noting that the word factory came into usage in England in 1803, preceded by the late 18th century term, manufactory. Both Pevsner and Reyner Banham (A Concrete Atlantis: U.S.Industrial Building and European Modern Architecture, MIT Press, 1986) as well as others, discuss and differeniate the significant aspects of factory building design in terms of structural systems and materials, and do not distinguish factories by their products (shoes, furniture, garments, meat, chemicals, etc.) as does the HAER Engineering & Industrial Classification System. Banham succinctly summarizes the 19th century factory as "one of the most successful (in terms of Darwinian survival) vernacular building types in the recent history of architecture." He furthermore emphasizes the standardization of factory design when he concludes that, "local variations and detailing notwithstanding, the demand for rational construction and rationalized production processes, combined with the need for compact plans, meant that whether built of brick or stone, with an internal structure of wood or iron, its overall form would be pretty well invariant, wherever it stood upon the Earth's surface."

Drawing upon Banham's analysis of structural development, buildings identified as factories in the Landmarks survey may be grouped into four subtypes which reflect both external and internal structural systems and design. As Banham argues, economic motives (optimum productivity) prompted a continuued search for more adequate lighting and greater fire resistant qualities which resulted in changes in design and materials.

FACTORY SUBTYPE A : Brick bearing wall pierced with openings. (Figs.# 2-8). This multi-story building is the most conservative of the factory types, exhibiting essential characteristics of its late-18th and early 19th century European and American antecedents. It features a brick bearing wall pierced by superimposed rows of regular fenestration, and rises from an exposed stone foundation. Most examples feature windows employing segmental arches -a typical Georgian form used for its strength - but flat linteled openings are also found, usually in late-19th and early 20th century factories. The roof almost invariably is flat (sometimes masked by a low parapet), an American development which according to Banham evolved largely because it provided a more economic use of attic space than the sloping roof offered. First story loading docks are common on one or more elevations, as are metal fire escapes. A corbelled brick cornice may or may not be present. The internal structural system most often indicated on Sanborn maps was "wood posts", which presumably is the heavy-timber, slow-burning type which was widely adopted in 19th century American factory design. (Although interiors were not

inspected in these survey phases, it is recommended that future surveys consider internal structure as a significant element of industrial design). The factories inventoried in this subtype varied widely in type of product manufactured: boxes, chairs, paint, meat etc., and did not differ significantly from factories outside the survey areas producing other products such as shoes (Fig.# 7). Although characteristics of the 12 story Belcher Sugar Refinery (Fig.# 8) fall into the general subtype A, its greater number of stories (far exceeding the typical 2 to 5 story height) is apparently due to the specialized function of refining sugar which required "considerable height, so as to admit of the sugar in solution being let down from story to story in the various stages, and to gain the advantage of the pressure of a column of liquid which is required in the course of refining."

FIGS. 9-15 FACTORY SUBTYPE B: Brick-pier and spandrel construction. This modification of the solid brick bearing wall pierced with windows introduced a distinctive new vertical formula to the design of factory elevations while making structural changes that would improve interior lighting. By employing thick brick piers at intervals, the wall was sufficiently stabilized to allow thinner spandrels and larger windows, thus permitting more entry of even light into the work area. Judging from illustrations of mid-19th century St.Louis industrial buildings (Fig.# 9), the pier and spandrel system was a parallel tradition. Numerous examples were inventoried in all three phases of the survey, with buildings dating from the late 1870s to the early 20th century. The later buildings (Fig.# 15) tend to have larger windows extending almost from pier to pier. In other respects, the pier and spandrel (or pilastered wall) subtype shares characteristics of Subtype A: exposed stone foundation (or concrete in some later examples); corbelled brick cornice; openings headed with segmental arches or flat lintels; flat roof; mill construction or iron columns; loading docks; and metal fire escapes. Although the pier and spandrel system became a well-established vernacular tradition, it also could achieve high artistic effects in the hands of certain architects who combined it with Classical or Romanesque Revival idioms.

FIGS. 16-23 FACTORY SUBTYPE C: Fireproof skeletal frame of reinforced concrete or protected steel. Figs. # 16-23). Only with the introduction of new materials (steel and concrete) was the wide-windowed true "Daylight" factory possible in which the wall was opened up to maximum via a fireproof skeleton frame. The significant gains in quantity and quality of interior light is demonstrated in Fig.# 16. The changes in visual appearance of the exterior wall are easily seen in brick bearing wall buildings which received additions constructed with reinforced concrete frames (Figs.# 17, 18). The new wall type is stripped down to a structural grid which is glazed with multi-paned industrial windows having a horizontally proportioned orientation, and set close to the exterior wall plane. However, the majority of inventoried buildings constructed with concrete frames also featured brick curtain walls rather than exposed concrete. This tendency or bias is likely due to the strong brick tradition in St.Louis, and the active brick lobby against the new material. Often vestiges of the old brick bearing wall architectural image are preserved in the brick curtain

walls which are articulated with pilasters and corbelled brick - - features which are superfluous in terms of structural requirements. It is interesting to see that several concrete-frame buildings in the survey were designed by engineering firms (some out-of-state), reflecting a national trend in which the engineering profession emerged as leaders in industrial design. Nonetheless, prominent local architectural firms such as Weber & Groves, Mauran, Russell & Garden, and T.P Barnett & Co., collaborated with engineers or construction companies in the design of early concrete-framed factories. A 1909 design of Tom Barnett (Fig. # 22), one of the few exposed concrete-wall factories, exhibits refinements in the new concrete aesthetic. At least one example of a fireproof steel-frame factory with brick curtain walls was inventoried (Fig.# 23). Although achieving the same fireproof conditions and exterior wall articulation as the reinforced concrete factory, the steel frame with fireproof cladding (terra cotta) was less popular in industrial buildings because of increased costs of construction. Concrete-frame buildings erected in St.Louis during the first decade or so of the 20th century merit further study of their interior structural systems as they are representative of an important period nationally when industrial design was the laboratory of technological experiment and advancement.

FIG. 24-34 FACTORY SUBTYPE D: Single-story clerestory production shed. (Figs.#). It is debatable whether this building type should be classified as a Factory Subtype or as an individual property type. While its function was to house manufacturing industries (and in that respect it was a factory), its distinctive high clerestory ventilator monitor and typical one-story height distinguishes it from the multi-story factory type. The building appears to have been a standard type used for foundries during the 19th century (Fig.# 24), and in the surveys three properties were identified as former foundries (Figs.# 25,26) . The high clerestory with monitor was well-suited to foundry needs of space for gas, smoke, and steam to rise and exit, in addition to allowing space for cranework, and admitting all-important light. A large center door opening accomodated the removal of large castings. Also characterisitc of foundry design is an extended linear plan, illustrated in the foundry at 146 Chouteau/1000-12 S.Second. The generic clerestory monitor building type was not, however, used exclusively for foundries. Inventoried properties associated with other uses included a "factory" (Fig.# 27), and a ~~lumber yard~~ planing mill ~~warehouse~~ (Fig.#28), the latter a frame building covered with corrugated metal; illustrations of other St.Louis buildings indicate such varied uses as brick manufactory, tobacco warehouse, dairy manufactory, and wire rope factory (Figs.#29,30. A pilastered brick wall pierced with large windows running the building length is standard treatment, and by the late-19th century steel truss roofs were employed.

Related to the clerestory production shed is the single story skylighted building such as 3130 N. Broadway (Fig.# 31) built by More-Jones Brass & Metal Co. c.1910, featuring a fireproof concrete frame and brick curtain wall. Although not visible from the street, twenty-two skylights punctuate the length of the building running from Broadway east to N.Second Street. The single-story factory or

production shed with skylights and large square or rectangular wall windows with multi-pane glazing became a standard type in the early 20th century. It flat roof was often masked by a low, shaped-parapet coped with terra cotta (Figs.# 32-34). An article in The Architectural Record (February 1909) entitled "Architecture and Factories" remarked on the recent trend toward "low buildings, large floor areas of one-story height lighted from above" which were recognized as being "preferable to high buildings for manufacturing purposes in all districts where the cost of land is not prohibitive".

2. WAREHOUSE

FIGS 35-45 In the Great Evolution of specialized building types, it seems that warehouses derived from medieval market halls, and factories from warehouses (See Pevsner's A History of Building Types, Chapts. 13, 15). Pevsner treats office buildings and warehouses together in Chapter 13, explaining that, "as a rule warehouse refers to the storage of one firm which more often than not has office space in the same building." Survey findings confirm that often there were multiple (and changing) uses in a single structure identified (by building permit) as a warehouse, and that sometimes it is not readily apparent what physically distinguishes a warehouse from a factory, or a warehouse from an office building. Fig.# 35 conveniently labels the multiple uses of a newly erected 1890s Washington Avenue industrial building which comprised warehouse, factory, and office in a stylistically unified single structure, supporting a thesis that form does not express function; or, that warehouse and factory functions are not significantly different in terms of requirements of a building to house those functions.

Warehouses inventoried in the surveys could be divided into two major groups: A) buildings which combined storage with company offices; and B) buildings which served primarily as storage facilities. Subtype A (Figs.# 36-39) can usually be distinguished by formal exterior articulation in a period style (sometimes richly ornamented), with a main entrance given prominent architectural treatment. Like the office building type, these warehouses when several stories high follow the classic tripart elevation composition of base, shaft and capital. They usually differ from office buildings in their internal structural systems (often requiring extra heavy load-carrying floor construction) and spatial arrangements, and also differ sometimes on front elevations which feature loading docks. Subtype B (Figs.# 40-45) exhibits basic characteristics of the factory in its various structural subtypes, with little or no architectural pretension. A few examples suggested that warehouses require fewer and smaller windows than factories, but perhaps need more locking docks (Fig.# 45). A few specialized warehouse facilities will be discussed as individual property types although they are clearly members of the warehouse family.

3. GRAIN ELEVATOR

FIGS. 46,47 The two grain elevators inventoried in the surveys (Figs.# 46,47) are both reinforced concrete construction, and exhibit the characteristic forms of either tall cylindrical or rectangular shape. Their materials and design represent early 20th century solutions to the problems of grain storage (a fireproof storage chamber having high tensile

strength). They feature loading docks at the base, and a minimum number of windows at the top. As Banham notes in his chapter on grain elevators, a change in handling process led to the development of the long, high narrow elevator complexes of the 20th century, and, what makes a grain elevator an elevator is the mechanical system, not the particular form of the building. He further challenges the notion that every industrial function has a corresponding recognizable structural form by pointing out that the concrete "grain" cylinder was used for housing machinery and offices in addition to grain.

4. COLD STORAGE/SALT WAREHOUSE

FIGS. 48-50 The unarticulated exterior elevations of this multi-story building type Figs. # 48-50) express its requirement of a tightly sealed, insulated structure (akin to the grain bin in this respect). The interior, however, is divided into typical warehouse storage floors. Wall construction is either brick bearing or curtain wall; concrete floors and roof are common; one example features all reinforced concrete construction with floors, walls and roof insulated with cork. A mechanical system of refrigeration pipes was installed throughout the cold storage buildings (apparently in the walls and floors). It is not known what was required for salt storage, or why exactly the salt storage building resembles the cold storage type.

FIGS. 51-53 5. RAILROAD/TRUCK FREIGHT WAREHOUSE

These buildings are designed to accommodate the efficient transfer of shipments from a train or truck to a warehouse. They feature multiple identical ground level dock bays, linear in plan, so-arranged to allow simultaneous loading and unloading of several freight train cars or trucks; storage space is sometimes provided in upper stories. In the rail freight examples (Figs.# 51, 52) the length of the building parallels the tracks, while docks of the truck terminal open to and parallel a street or alley (Fig.# 53). This building type was apparently early-developed judging by its appearance in Compton & Dry (1875) where it is illustrated in Plate #46, (building #14), along the rail tracks. Materials of construction vary from brick and frame to reinforced concrete in the five and six story, 28-bay rail freight depot at 1400 N.First. This warehouse subtype may also feature offices, entrances to which are usually given some distinguishing architectural treatment in a period style; even the monolithic reinforced concrete depot displays an entrance with a terra cotta modillioned pediment with the word "Office" lettered in terra cotta.

FIGS. 54-58 6. POWERHOUSE

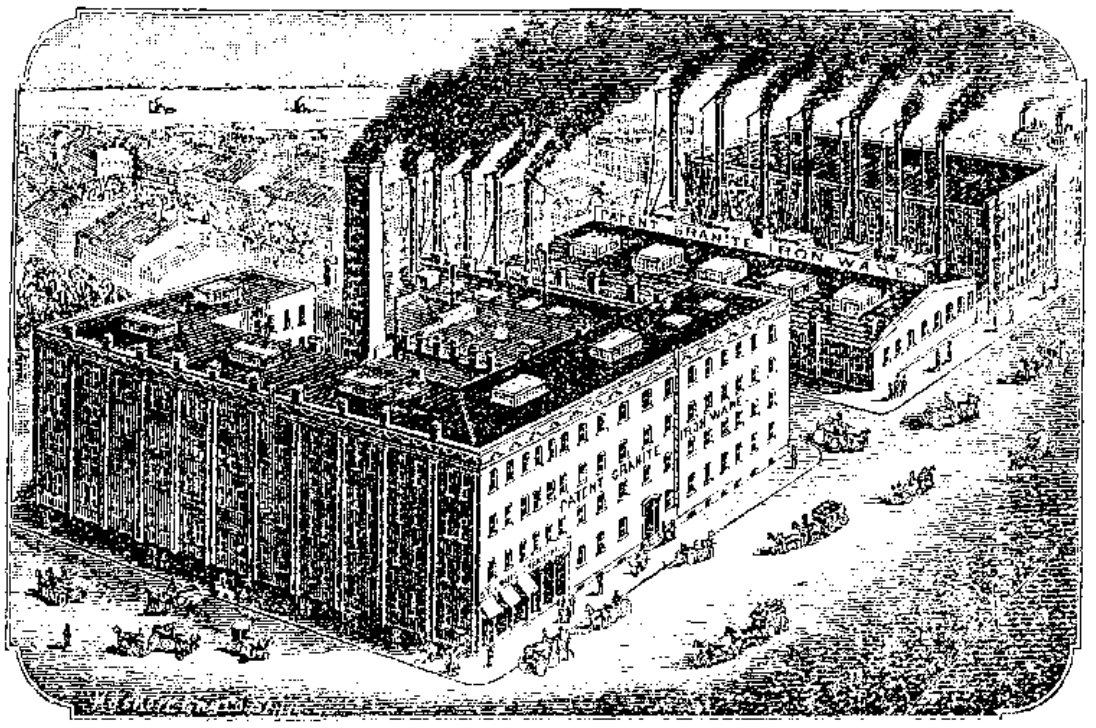
At the end of the 19th century large generating stations were a relatively new building type which was rapidly evolving as new systems of power were being developed to serve modern industries. Power plants had developed from small, ordinary buildings to complex structures often of great size which required collaboration of engineers to work out all important structural and mechanical systems, and architects who provided suitable exterior appearance. Generally, power houses are of rectangular plan with a longitudinal brick wall separating the engine house from the boiler house (Fig.#54, Sanborn map). Fireproofing was critical, especially in the roofs of the engine and boiler houses which often were concrete carried on steel trusses. Concrete was also

commonly used for foundations (which were designed to carry enormous loads) and for floors. A steel skeleton frame with brick curtain walls was the usual wall construction. Building height (comparable to three or four stories) was a necessary design element to accomodate large boilers with overhead coal hoppers which fueled the boilers. Tall smoke stacks were a standard appendage. Exterior elevations were often articulated with tall round-arched windows, but display restraint or absence of ornamentation (Figs.# 55,56). An exception to the more standard utilitarian exterior design is the richly embellished power plant at 1200-04 Lewis Street (Fig.# 57,58). All of the power houses were connected to rail lines, essential for delivery of their source of coal fuel.

RECOMMENDATIONS FOR FUTURE INDUSTRIAL SURVEYS:

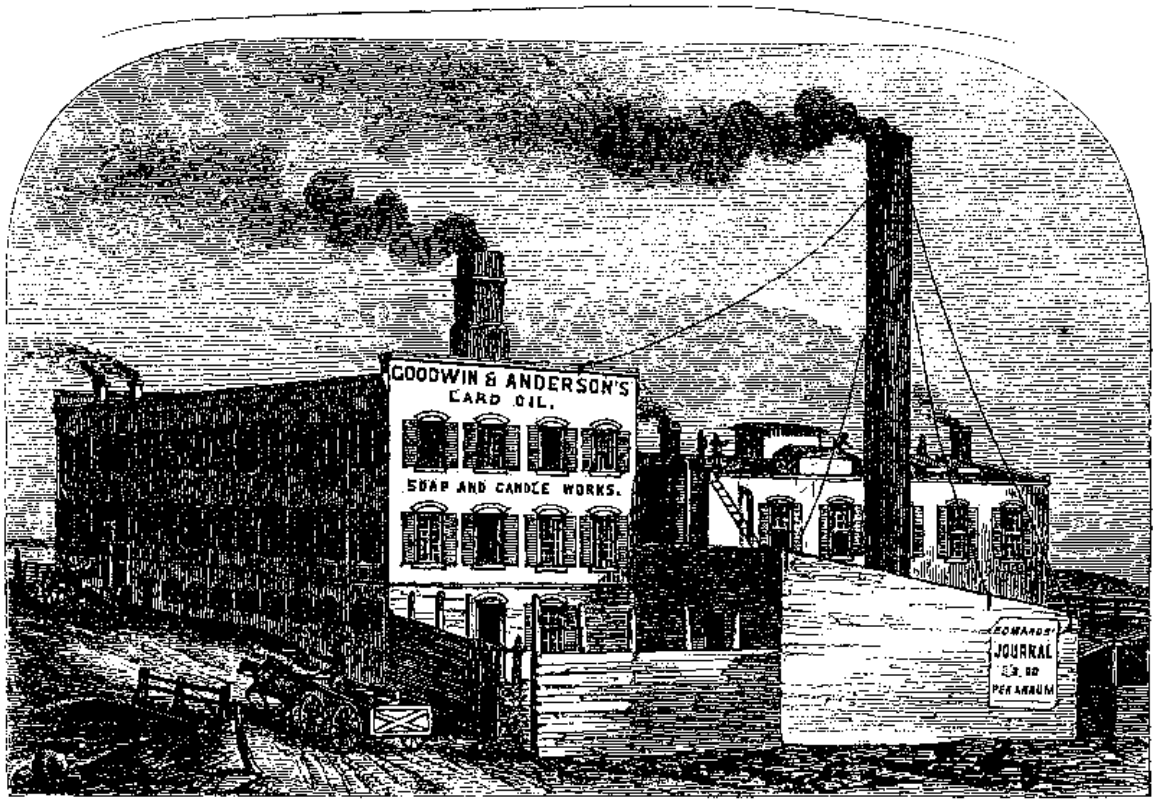
The importance of the railroad to the development of the industrial corridor along St.Louis' riverfront can not be overemphazied. Efficient delivery of raw materials and shipment of finished products were dependent upon rail service. The major industrial buildings inventoried in Landmarks Association's three-phased survey were all directly served by rail lines. Therefore location of any future industrial survey areas should follow rail lines throughout the city. This would include rails that extend south of Chouteau's Landing, as well as rail corridors which run east-west.

FIG. #1



St. Louis Stamping Co.'s Plant.

FROM COMMERCIAL & ARCHITECTURAL ST. LOUIS (1891)



VIEW ON ADOLPH STREET, CORNER OF POPLAR STREET.

FROM EDWARD'S GREAT WEST (ST. Louis, 1860)

FIG. 1