AGENDA

PLANNING COMMISSION

Regular Meeting

July 10, 2018

6:00 p.m.

City Hall

1000 City Parkway

Osage Beach, Missouri

REGULAR MEETING AGENDA

1. CALL TO ORDER
2. ROLL CALL
3. APPROVAL OF MINUTES FROM THE JUNE12, 2018 MEETING
4. NEW BUSINESS
   A) CITY OF OSAGE BEACH SEWER GUIDELINE AMENDMENTS
5. ADJOURN MEETING

MINUTES OF THE REGULAR MEETING
OF THE PLANNING COMMISION FOR
THE CITY OF OSAGE BEACH, MISSOURI

June 12, 2018

The Planning Commission of the City of Osage Beach, Missouri, met to conduct a regular meeting on June 12, 2018 at 6:00 p.m., at City Hall in said City. The following Commissioners were present: Mayor John Olivarri, Alderman Richard Ross, Susan Ebling, Michelle Myler, Tony Kirn, Alan Blair, Don Chisholm, Don Sturn, Roger Rand. Nancy Viselli was absent. Also present were: City Engineer Nick Edelman, City Planner Cary Patterson, and Department Secretary Brook Cason who kept a journal of the proceedings.

Minutes:

On a motion made by Susan Ebling and seconded by Michelle Myler, the minutes of the February 13, 2018 meeting were unanimously approved as submitted.

New Business:

A) Special Use Permit Case No. 400

Mayor John Olivarri spoke in place of Chairman Jerry Fox who was no longer on the Planning Commission and would act as Chairman until one was appointed later in the meeting. He then asked Planner Patterson to give his report.

Planning Department
To The
Planning Commission

Date: June 12, 2018	Case: 400

Applicant:	A Colorful Life, LLC (Belinda Phillips) Property Owner Fred Dehner, Proposed Developer
Location:	Approximately 400 feet west of Osage Beach Parkway on the north side of Zebra Road
Petition:	Special Use Permit to allow extended stay rental units in a Commercial District.
Existing Use:	Vacant commercial building.
Zoning:	C-1 (General Commercial)
Tract Size:	Approximately 24,000 sq. ft.

	Surrounding Zoning:	**Surrounding Land Use:**
North:	R-1 (Single Family)	Lake Area Anchor Club

South:	C-1 (Commercial)	Shopping Center
East:	C-1 (Commercial)	Dance Academy
West:	R-1 (Single Family)	Residential

The Osage Beach Comprehensive Plan

Designates this area as appropriate for: Moderate Density Residential

Rezoning History	**Case #**	**Date**
City Wide		1984

Utilities: Water: **City** Electricity: **Ameren UE**
Sewer: **City**

Access: Property has frontage on Zebra Road.

Analysis:

1. The applicant is the owner of the vacant property in question.
2. The character of the area is mixed containing moderate density residential and the Osage Beach Parkway commercial corridor.
3. The current proposal is to convert the existing facility from a commercial office building into a multi-unit residential dwelling facility. It will be used as a rental facility with multi-tenant capacity.
4. The portion of the property that is being requested for SUP is fronted and serviced by Zebra Road.

Department Comments:

The property is recommended for Moderate Density Residential, which is defined by the Comprehensive Plan as 5-13 units per acre. In this situation we are not looking at a large lot residential development. The density on this request is not any concern as it would be a low number of units in an existing commercial facility.
For the purposes of what would be more beneficial to the City, having the additional well-maintained housing units would serve a need of the community, and be a better fit for the property, than that of a commercial use. It is also important that the City be willing to promote structure repurposing on properties, such as this, to stimulate additional commercial activity in the area by providing more consumers in the immediate service area of one of our busiest retail locations.
The biggest incentive to a request like this, is the location of housing units in an area that contains many retail, entertainment, and service jobs in our community. Providing this housing will allow some workers to live near their job location. This is a valuable benefit for both the employee and the employer.

Under the Section 405.610 of the City Code of Ordinances for Amendments and Changes, bullet point 6 gives five matters that the city should consider before making a change in the use of property.

1. **Relatedness of the proposed amendment to the goals and outlines of the long range physical plan for the City:**

   As already stated, the request is in conformance with the use recommendations of the Comprehensive Plan.

   The Comprehensive Plan also encourages the City to provide additional work force housing when the opportunity arises to locate it on property where it is compatible.

2. **Existing uses of property within the general area of the property in question:**

   The area surrounding the subject property contains mixed uses including moderate density residential, storage facilities, and Osage Beach Parkway commercial corridor.

   The request provides a use that works with the existing mix of low impact and intensity uses.

3. **The zoning classification of property within the general area of the property in question:**

   The zoning of the surrounding properties is a mix that basically coincides with the uses. The requested use will mesh without issue with the surroundings

4. **The suitability of the property in question to the uses permitted under the existing zoning classification:**

   The use of this property as a low impact commercial use (office or storage), would not cause issue in the area. However, the conditions lend more towards the use of the facility for rental residential and likely will keep the facility from sitting empty for some time.

5. **The trend of development, if any, in the general area of the property in question, including changes, if any, which have taken place in its present zoning classification:**

   The secondary corridor has seen little development in recent years. There is currently some activity for low impact commercial in the nearby vicinity that will make the subject property and facility a transition between the commercial and residential uses.

Based on the analysis of the conditions pertaining to the subject petition, the Planning Department recommends approval of the request subject to the following provisions regulating the property being granted a SUP for repurpose of the existing office facility into rental units:

Permitted Uses:

The following uses shall be permitted in those areas as illustrated on the PUD site plan:

1. Residential Uses shall conform to the requested repurposing of the existing facility into rental residential units.

2. Accessory Uses will be designed for and available to the tenants and their guests only and will not be open to the public. Those uses include any administrative office(s) for project management, garages, maintenance facilities, and recreation facilities. At this point, there are no accessory buildings planned.

Construction:
Construction shall be in accordance with the International Building Code and all other pertaining construction codes as adopted by the City of Osage Beach at the time a building permit is issued for each individual facility.

Bulk, Area, and Height Requirements:
Construction for these units will be confined to the existing facility.

Dimensional Requirements:
Will be confined to existing facilities and meet all setback requirements for the existing zone.

Public Facilities:
Engineering plans for any required water or sewer improvements will be constructed in accordance with the Osage Beach Design Guidelines and shall be approved by the Public Works Director.

Access:
Access shall be derived from the existing entrance to the property off Zebra Road.

Parking:
All development shall adhere to Osage Beach off-street parking requirements at the time that it is constructed.

Buffering and Screening:
No additional buffering or screening is required. Waste cans or dumpsters shall be placed in a location as to have minimal visual impact to the surrounding properties and conform to the general practice and placement of the same facilities within the corridor.

Exterior Lighting:
Exterior lighting shall be designed, located and constructed to eliminate or significantly reduce glare and/or a general increase in lighting intensity within the adjoining existing or proposed residential area(s). Additionally, all exterior lighting shall be so arranged and shielded to confine all direct light rays within the boundaries of the subject property.

Signage:
The applicant will be required to obtain a sign permit from the city. At such time that an application is filed, a site plan and engineering will be submitted to assure the signs compliance with the city's sign code for on premise residential signage.

Maintenance of Open Space and Common Areas:
The maintenance of common area and facilities within the District shall be the responsibility of the property owner(s) and/or the property management administrators.

Platting:
All platting of property will be required to be in conformance with the Osage Beach Subdivision Code.

Final Development Plan:
The site plan required for the building permit application will serve as the Final Development Plan.

Mayor John Olivarri asked if there were any questions from the Planning Commission, there being none he asked if there was anyone from the public that wished to speak in favor or opposition of this special use case.

Fred Dehner came forward representing Belinda Philips. He stated he had been a developer in then area for 25 years and had several rentals in the City of Osage Beach. The sale of this property was contingent on the approval of this Special Use Permit. He told the Commission his plans were to convert the building into eight, one-bedroom efficiency rental units and asked if the Commission had any more questions.

Tony Kirn asked how much he planned on renting them for.

Fred Dehner answered six hundred dollars per month.

Michelle Myler asked if the rent would be yearly.

Fred Dehner answered yes.

Susan Ebling asked if they were going to be low income or subsidized housing.

Fred Dehner answered no.

Mayor John Olivarri asked if there were any more questions or comments.

Bob O'Sten came forward as a resident of the Compass Point Condo Association. He stated that his questions had been answered regarding the housing type, but he wanted to voice his concerns with the parking situation with the neighboring building and the street parking that occurred on Deer Run when there were meetings at the Anchor Club.

Mayor John Olivarri asked Planner Patterson what parking would be required with this new use.

Planner Patterson answered one and a half spaces per unit. He added that the neighboring building had a big enough lot to provide adequate spaces and the City would address that issue.

Tony Kirn asked where the entrance to property would be placed, he had concerns that there isn't adequate space to provide additional spaces, and a driveway for entrance.

Fred Dehner stated that the entrance would be off Zebra and that the parking would be addressed once they have the approval to move forward with the plans.

Matthew Schwenn came forward as a resident of the neighborhood. He announced that as a local Police officer for the City of Osage Beach he has seen a lot of issues arise from properties such as these. He has seen the same parking issues at the Mexicali Blues, and Westside Apartments. In addition, dwellings like these tend to get neglected with time and have high tendency for crime.

Michelle Myler stated that she lives off Dude Ranch and can attest to Fed Dehner's properties stating that are well kept and has never known there to be issues of crime.
Mayor John Olivarri added that Fred Dehner's history as a developer within the City of Osage Beach is a real advantage for this type of development.

Matthew Schwenn stated he also had concerns for the certain types of tenants that would be living in these units. Would there be background checks done and will there be an occupancy limit. All too often has he seen single mothers move in with children. If that were to happen there aren't adequate play areas. Plus, the parking won't be sufficient enough if each person per unit has their own vehicle. As a resident of Harbor Heights these are his concerns and as a police officer these are the issues he's seen.

Don Sturn stated that the he was a retired Fire Fighter and the Fire Code addresses all occupancy requirements.

Fred Dehner answered that his company does do background checks and there is an occupancy limit of 2 people per unit and that if parking became an issue the lot was big enough to provide additional spaces.

Planner Patterson reminded the Planning Commission that they shouldn't base their decision on Fred Dehner being the developer because he can always sell. He also wanted to remind them that the approval of this use would address two issues. The first issue being the lack of housing the second issue being an empty unused building.

Don Chisholm asked about Brenda Phillips ownership.

Mayor John Olivarri answered that currently Brenda Philips was the owner asking for this request. She was doing so in order sell the building to Fred Dehner.

Robert Long came forward as a property owner living in the neighborhood. He had noticed Tony Kirn out looking at the property as well as a survey being done of the property. His main concerns were the noise and cleanliness issues that could result in a property with this use. He voiced his concerns with the City taking care of issues such as these and made mention of a problem property in the neighborhood.

Jake Hartman came forward next and stated similar concerns in addition to property value going down due to the multi-family units.

Planner Patterson wanted to add that unless the issues are brought to the City's attention they can not be addressed and corrected. He personally has seen more compliance related issues from single-family dwellings. There is limited staff, however last year the City hired a new compliance officer and her work load is call generated.

Roger Rand asked how long it could take to address compliance related issues.

Richard Ross stated that it was a process that isn't short, and it would take longer if it had to go to court.

Mayor John Olivarri asked if there were any more comments, hearing none he entertained for a motion.

Don Sturn made a motion to recommend to the Board of Aldermen approval of the Special Use Permit. Seconded by Roger Rand, a roll call vote was taken and unanimously passed.

New Business:

B) Appoint Planning Commission Chairman and Secretary

Mayor John Olivarri asked the commission for nominations on a new Chairman and Secretary.

Tony Kirn nominated Susan Ebling as Chairman and Nancy Viselli as Secretary.

There being no further nominations, Mayor John Olivarri appointed Susan Ebling as the new Chairman for the Planning Commission, and Nancy Viselli retained her position as the Planning Commission Secretary. Mayor John Olivarri congratulated Susan Ebling and asked her to proceed to the dais to finish the meeting.

Susan Ebling took her chair and asked if there were any reports.

Reports:

Don Chisholm wanted to comment on how professional and polite the local police officers had been on the last few visits made to his neighborhood and gave his apperception to Officer Schwenn for attending the meeting and voicing his concerns.

Planner Patterson wanted to remind the commissioners that if they see compliance related issues around town, that they can call and report these concerns to the City's compliances officer.

Don Chisholm asked what the Compliance Officers name was.

Planner Patterson answered Katie Phelps and said that Brook Cason was also secretary over the department and could take all compliance related calls.

Tony Kirn asked if the road going into the post office was a compliance related issue.

Nick Edelman answered no, but a solution was in the works, he invited the Planning Commission to the Osage Beach Special Roads District meeting which would be held on Wednesday. It would be addressing Rowan Road a private road that has been problematic which run between the Post Office and Tallmans.

Susan Ebling asked if there were any more reports.

There being no further business to come before the Planning Commission, Chairman Susan Ebling adjourned the meeting at 6:55 p.m.

I, Brook Cason, Department Secretary of the City of Osage Beach, Missouri, do hereby certify that the above foregoing is a true and complete journal of proceedings of the regular meeting of the Planning Commission of the City of Osage Beach, Missouri, held on November 14, 2017.

_____

Brook Cason, Department Secretary

_____

Nancy Viselli, Secretary

June 27, 2018

MEMORANDUM

To: City Planner

From: Public Works Director

Reference: Sewer Design Guidelines

Subject: Osage Beach Design Guidelines

We have some changes and additions that we would like to make to the Design Guidelines. These changes deal with sewer design guidelines.

1) Wet Well Design: We currently require wet wells (storage tanks for sewer and the sewer pump) to hold 2 hours of peak flow above high level alarm. This causes wet wells to be rather large for multifamily projects and/or high flow users. The idea of requiring the large wet wells is that it allows Public Works Staff time to respond prior to the overflow. We have to be notified that the light is flashing to respond but this was the thought process. We have been looking into other options. We have been trying out smaller wet wells with SCADA attached to them. SCADA is a system that calls oncall personal when a pump has issues/when the high alarm is met and other items. This allows us to respond prior to emergency situation. We have evaluated the costs and have found that this can be a more cost-effective solution. We would like to offer this to the development community.
2) Pipe type for pressure pipe outside of the station – we would like to include HDPE pipe in our design guidelines. We have been using for a little while and have found that it works out well.
3) Internal wet well pipe in small grinder stations – we would like to require stainless steel pipe inside wet wells. We currently require galvanized. This material rusts and starts to leak. We are required to do a replumb to replace all of the pipe. Stainless eliminates this work.

There are some other minor changes, but these are the big changes.

(Revised 27 JUNE 2018 - NCE)

GENERAL

The City of Osage Beach operates a sewage collection and treatment system in accordance with the Missouri Department of Natural Resources (MDNR) regulations. The system is comprised of pressure and gravity sewer lines, grinder stations, lift stations, and a jointly owned regional sewage treatment facility. The plant is managed by the Lake Ozark / Osage Beach Joint Sewer Board. The collection system within Osage Beach, and from the city to the plant, is owned and operated by the City of Osage Beach. At the current time, there are a few isolated areas within the city that are not served by the collection system. It is the policy of the city that all occupied facilities within the city will have city sewer service.

At the present time, there are over 1125 grinder stations and 56 sewage lift stations. These stations have been standardized to use ABS/Sulzer pumps and appurtenances. This practice shall continue until determined by the city to be infeasible or otherwise unsatisfactory.

All modifications to the sewage treatment plant or the sewage collection system shall conform to the MDNR regulations and polices as supplemented herein.

REFERENCED CITY ORDINANCES

Chapter 400.110 Subdivision Regulations
Chapter 410.130 Contents (Location and design of water mains and appurtenances)
Chapter 410.190 Design Standards
Chapter 410.260 Location of Utilities in Right-of-Ways
Chapter 410.330 Sanitary Sewers
Chapter 710 Sewers and Sewerage Systems

SEWERAGE DESIGN

1. Waste Water Treatment Facility; Modifications to the existing treatment facility must be made under the direction of the Lake Ozark / Osage Beach Joint Sewer Board. Such modifications must be designed in accordance with, and approved by, the MDNR. If the city needs to have changes made in the plant, they must forward the request to the Joint Sewer Board.

2. Sewage Collection System; Modifications of, and additions to, the existing sewage collection system shall be made in accordance with MDNR regulations as supplemented herein.

3. Hydraulic Design shall be based upon the following criterion:

AVERAGE DAILY FLOWS

Type of Establishment	Pounds BOD per person	Gallons/Day per person
Residential		
Single family	0.17	100
Apartments	0.17	100
Condos	0.17	100
Commercial Food & Drink		
Tavern	0.01	2
Fast food	0.02	5
Restaurant	0.04	5
(with garbage grinder)	0.07	6
Car Wash (10.3 gpd/sf) (31.5 gpm Peak Hour / Bay)		See data To left
Institutions		
Day school		
W/ gym & showers	0.03	20
W/ cafeteria - ADD	0.02	4
W/ garbage grinding - ADD	0.02	1
Hospital - per bed	0.22	200
Nursing homes	0.17	125
Park restroom	0.02	5
Park restroom w/showers	0.06	25
Swimming pools	0.06	25
Country club per resident	0.17	100
Country club per member	0.06	25
Service Stations	0.01	5
Laundromats per machine	1.25	580
Hotels	0.15	50
Motel w/o restaurant	0.1	40
Luxury Resort	0.17	75
Camp trailer	0.08	30
Churches per seat	0.01	5
Stores, shopping centers, malls per 1000 sf of floor area	0.34	200
Stadiums, auditoriums, theaters or drive-ins per seat	0.01	5

*Includes infiltration

EQUIVALENT POPULATION

Facility	Persons/Unit
Single family residence	3.7
Apartment or condo	
one bedroom	2
two bedrooms	3
three bedrooms	3.7
Mobile homes	3
Camper trailer	3
Motels per room	3

PEAK HOURLY FLOW = 4 X AVERAGE DAILY FLOW

4. Gravity Sewers design shall conform to the applicable Missouri Department of Natural Resources regulations and as specified herein. The peak hourly flow shall be determined and the gravity line sized accordingly with the following additions:
   a. Gravity sewer laterals from a residence to grinder station or main:
      1) Shall be not less than 4-inch pipe.
      2) Shall have a cleanout located within 5 feet of the residence and at all vertical and horizontal bends; a sanitary tee within 5 feet of the grinder station or main; and a backflow valve adjacent the grinder station.
      3) Shall not exceed 150 feet in length. Residence service lines over 150 feet in length shall be treated as sewer mains.
      4) Shall be SCH 40 with SCH 40 fittings or ASTM D3034 DR 26 PVC with sanitary sewer DR 26 PVC or ductile iron fittings.
      5) All bends shall be long radius bends Short radius 90° bends are specifically prohibited.
   b. Gravity Sewer mains:
      1) Sewer mains shall be designed for the peak hourly flow and shall be not less than 8-inch pipe.
      2) Gravity sewer pipe shall be:
         a) Ductile iron, ASTM A746, Class 350 with cement lining. Ductile iron Push-on type joints and fittings shall be used, or
         b) ASTM 2241, DR 21, Class 150 with approved fittings.
         c) PVC, ASTM D3034, SDR 26, with SDR 26 PVC sanitary fittings.
         d) ASTM D3034, SDR 35, with SDR 35 fittings where maximum depth of cover is eight (8) feet or less.
         e) SCH 40 PVC with SCH 40 fittings
      3) Manholes shall be constructed at the end of main and at changes in horizontal or vertical alignment, or not more than every 350 feet.
      4) When a residence service line will exceed 150 feet, a manhole shall be constructed with a 4-inch service line to the residence and a minimum eight-inch main to remainder of the system.

5) All bends shall be long radius bends. Short radius 90° bends are specifically prohibited.

c. Connections to sewer mains shall be made using a sanitary wye tapping fitting.

d. Connections to grinder pump basins:
   1) Shall be made using a cast iron inlet hub of appropriate diameter and shall be bolted to the grinder basin and sealed with an approved silicone seal. A PVC backflow valve (check valve) shall be installed within 2 feet of the basin.
   2) Inlet pipes shall be installed a minimum of four feet above the bottom of the grinder basin and not less than 18 inches below the top of the basin.

e. Bedding:
   1) Shall be installed around the pipe from 3 inches below to 12 inches above the pipe. Bedding shall be nominal ½ inch minus crushed rock conforming to MoDOT Section 1004, Grade D, Chat, or pea-gravel, or Osage River Sand. Any material used shall have a PI of six or less.

f. Detectable Marking Tape and Toning Wire:
   1) Metallic detectable marking tape, Type III, shall be placed in the trench above all sewers, gravity and pressure, one foot above the pipe.
   2) No. 12 solid copper toning wire shall be located three inches above the sewer line and shall be continuous from terminus to terminus and shall include all city owned sewers.

g. Minimum grades for gravity sewers:
   1) 4-inch sewer shall be not less than 1.00%
   2) 6 inch sewer shall be not less than 0.67%
   3) 8 inch sewer shall be not less than 0.50%
   4) 10 inch sewer shall be not less than 0.33%
   5) Larger shall be as approved by the City Engineer

h. Minimum depth of cover for gravity sewers:
   1) Shall be not less than 18 inches above the top of pipe

i. Maximum depth of cover shall be eight (8) feet unless specifically authorized in writing by the City Engineer.

j. Manholes:
   1) Shall be as detailed in the Osage Beach Design Guideline
   2) Or as approved by the City Engineer

k. Valve Boxes:
   1) Shall be Buffalo type with cast iron lid marked "sewer".

l. Leak testing for gravity sewers:
   1) Gravity sewer lines may be tested by air or water method.
      a) Water Tests: Gravity sewer lines shall be plugged at the bottom end and filled with water to the top of the next upstream manhole; or if no manhole, to the top of the farthest upstream cleanout; and left for twenty-four hours. The line shall then be refilled with a measured amount of water. The allowable leakage shall be one gallon per hundred feet of line tested.
      b) Air Tests: Test lines between manholes with low-pressure air. Safety requires a regulator or relief valve on pressurizing

equipment, set at 8 psig. No one will be allowed in manholes while there is air pressure against test plugs.

1) Plug all pipe outlets to resist test pressure. Give special attention to laterals.
2) Plug all other pipes in both upstream and downstream manholes and fill manholes with clear water to just above the line plugged for testing. Any bubbles appearing during the test indicate leakage past a plug or in part of the test equipment.
3) Compute the test pressure by multiplying 0.43 times the elevation difference (in feet) of the upstream manhole rim and the invert of the line under test at the downstream manhole. The result is in psig and may be rounded to the nearest half psig. The test pressure shall be not less than 3.5 psig, nor more than 6.0 psig. Total line length included in any test section shall not exceed 400 feet.
4) Supply air into the line until test pressure is attained. Allow at least 5 minutes for air temperature in the test section to stabilize.
5) Reestablish the test pressure, and start a stop watch. Determine the time required for pressure to drop 0.5 psig.
6) If the pressure does not drop during the stabilization period, and no additional air has been added, the section undergoing test will have passed without further testing.
7) The pipe section will also have passed if the time observed for the pressure to drop 0.5 psig is greater than that determined by using the following table:

Pipe Size, Inches	Time
4	4 minutes 2 seconds
6	6 minutes 0 seconds
8	7 minutes 37 seconds
10	9 minutes 8 seconds
12	10 minutes 58 seconds
14	12 minutes 30 seconds
16	14 minutes 32 seconds

When a combination of more than one pipe size is under test, the calculated time for the larger pipe shall apply.

2) Manholes may be tested by vacuum or water method.
   a) Water Method: Manholes shall be tested by plugging inlet and outlet pipes and filling with water to the top of the manhole cover ring and letting set for twenty-four hours. The maximum leakage shall be a drop in water level of three inches.

5. Pressure Sewers design shall conform to MDNR requirements and as supplemented herein. The design of additions to the city sewer system shall minimize the need for pressure sewer to the maximum extent practicable in order to reduce the number of lift or grinder stations to the minimum required. Pressure sewers shall conform to the following criterion:

a. Pressure sewers shall be designed for flow rates between 2.0 fps and a maximum of 5.0 fps. The minimum diameter of pipe used shall be 1-1/4 inches.

b. Pressure pipe:
   1) Less than four inches in diameter shall be schedule 80 PVC or ASTM 2241, DR 21, Class 150, or HDPE AWWA C906, DR 9 copper tube size.
   2) Four inches and larger shall be: AWWA C151 Class 350 ductile iron, or AWWA C900 DR 18 Class 150 PVC.

c. Joints:
   1) For SCH 80 pipe shall be solvent welded.
   2) For other pipe shall be neoprene lined push-on type joints or as approved by the City Engineer.

d. Fittings:
   1) For Schedule 80 pipe shall be Schedule 80 fittings.
   2) For other pipe may be appropriately rated and compatible PVC or ductile iron on PVC and shall be ductile iron on ductile iron sewers. All fittings shall be neoprene gasket push-on type or as approved by the City Engineer.
   3) Long radius bends or multiple fittings shall be used. The use of short radius 90° bends is prohibited.

e. The minimum cover for pressure sewer is 36 inches.

f. The maximum depth of cover for pressure sewers is eight (8) feet unless specifically authorized in writing by the City Engineer.

g. Bedding shall be installed around the pipe from 3 inches below to 12 inches above the pipe. Bedding shall be nominal ½ inch minus crushed rock conforming to MoDOT Section 1004, Grade D, Chat. Any material used shall have a PI of six or less.

h. Detectable marking tape and Toning Wire:
   1) A metallic detectable marking tape, Type III, marked "Sewer Below" shall be placed in the trench one foot above all pressure sewers pipe.
   2) A No. 12 solid copper toning wire shall be installed three inches above the pressure sewer and shall extend from terminus to terminus.

i. The check valve shall be brass body, single flap type.

j. The inlet connection hub shall be cast iron inlet hub bolted to the basin. The back of the hub shall be sealed to the basin using approved silicone sealant. Appropriate inlet hubs are stocked by the ABS supplier.

k. An isolation valve shall be installed at the connection to the sewer main. The valve shall be brass body, globe valve of the same nominal size as the pressure sewer shall be installed at the connection to the sewer force main. The valve should be located so as to be outside roadway or other similar traffic areas. The globe valve shall have integral checks for open and closed positions. The valve shall be placed upon a concrete, or approved, masonry pedestal to prevent settlement; shall be covered with a buffalo type valve box and cover extended to one inch above the finished surface. If the finished surface is concrete or asphalt pavement in which case the valve box cover shall be flush with the paved surface. Valve box covers on pressure sewers shall be marked "SEWER". The markings shall be cast into the cover.

l. The tapping saddle shall be Brass similar and equal to Ford. The tapping saddle shall be sealed to the pipe by means of a rubber "O" ring seal to provide a connection suitable for a working pressure of 200 psi. Tapping saddles shall have flanged or threaded outlets conforming to ANSI B16.1. If at all possible, all tapping saddles shall be in the horizontal position. Under no circumstances shall anyone make a wet tap without approval and authorization by the City Public Works Director.

m. Leakage test: Testing procedure is as follows:
   a. Upon completion of the water main it shall be cleaned and all dirt, trash, debris, and deleterious materials removed from the line.
   b. Filled to capacity and all extraneous air removed.
   c. Pressurize to 75 psi above normal working pressure at the test location and hold for a period of not less than two hours.
   d. At the end of the testing period the line shall be refilled with water and the amount of water to refill the line shall be measured and recorded.
   e. The amount of water to refill the line must be less than the maximum allowable leakage. The maximum allowable leakage shall be computed thusly:

$$Q_{Loss} = SDP^{1/2} / 133000$$

Where:

Q_{Loss} = Maximum allowable leakage
S = Length of the section tested in feet
D = Diameter of the pipe in inches
P = Test Pressure, PSI

DESIGN OF GRINDER PUMPS AND SEWAGE LIFT STATIONS

The design of grinder pump installation shall be certified by a Registered Professional Engineer and shall conform to MDNR and the City Of Osage Beach requirements. In order to reduce maintenance and operational cost, the city has selected ABS / Sulzer pumps and equipment as their standard. Accordingly, all grinder pumps and lift stations shall be designed using ABS /

Sulzer equipment unless specifically authorized by the City Engineer. The size, type, and capacity of the grinder pump, or lift station, shall be based upon the hydraulic loading and gradient necessary to pump sewage from the source to an appropriate location.

1. Hydraulic Design Considerations
   a. Using the previously presented charts determine the following:
      1) Average daily flow (ADF)
      2) Peak hourly flow (PHF)
   b. Calculate the following and provide calculations in the design submittal:
      1) Total static head from the proposed pump inlet to point of discharge. The point of discharge will be to the next lift station wet well on the sewer pressure main.
      2) Total dynamic head This must include total static head plus line friction losses for pipe, fittings, and connections from the proposed pump to the point of discharge. This also must include friction losses for flow in the main assuming that a portion of the downstream pumps are running. The City Engineer will be able to assist in this determination.
      3) Pumping Rate based upon wet well size and a maximum cycle time at peak hourly flow of six times per hour.
      4) Wet Well Capacity based upon a minimum storage above high pump off elevation of two hours of peak hourly flow or 45 minutes with SCADA installed. Wet well capacity shall be determined as follows:

$$V_M = (Q_{PHF} \times 120) + V_{HPO}$$

Where V_M is the volume in the wet well below the inlet pipe, Q_{PHF} is the peak hourly flow in gpm and V_{HPO} is the volume in the wet well below the emergency pump on. The wet well design shall also conform to the following:

      a) The minimum diameter for simplex wet wells is 36 inches
      b) The minimum diameter for duplex wet wells is 48 inches
      c) The minimum depth from bottom invert of the inlet to bottom of the wet well is 48 inches.
      d) The maximum total depth of the wet well from lid to bottom is 12 feet.
      5) Select the pump model and horsepower from the ABS pump curves.
      6) Select the pressure line type and size as discussed under "pressure sewers" herein.
   c. Additional Limitations or Specifications for Grinder Pumps
      1) No more than two residences may be served by a simplex grinder station.
      2) No more than fifteen single-family residences, or their equivalent, may be served by a single duplex grinder station. This is subject to the review of the City Engineer.
      3) All commercial facilities shall have a duplex grinder pump station. In instances where a commercial facility has an average daily flow of less than 16 gpm, and no further development or additional capacity is

contemplated, a simplex pump and controls maybe installed in a duplex basin.

4) Triplex package units or custom-built lift stations are subject to the review and approval of the City Engineer.

5) Each Grinder Pump Station shall include an ABS pump(s) fiberglass basin including internal piping, pump base and guide rail; and ABS Pump Control Panel as described in the ABS specifications
   a) The basin will be an ABS basin, or the equivalent thereof, and either simplex or duplex as required. All internal piping and pump guide rails shall be stainless steel. A concrete anti-floatation ring shall be cast around the basin base. The basin cover (lid) shall be of steel with minimum thickness of ¼ inch and shall be coated with a high temperature baked epoxy or air-dried epoxy paint, green in color. The lid shall be fully bolted and/or hinged secured.
   b) All grinder stations of 6.2 HP or less shall have internal discharge piping of 1-1/4 inch stainless steel pipe.
   c) All grinder stations of more than 6.2 HP shall have stainless steel discharge piping of minimum two inch, or as approved by the City Engineer.
   d) All grinder stations shall have a brass-bodied globe valve installed in each discharge line within the grinder station at a location approved by the City Engineer.
   e) The minimum distance from top of grinder basin cover to top of inlet pipe shall be 18 inches.
   f) The minimum distance from top of grinder basin to bottom of discharge pipe(s) shall be 48 inches.
   g) The maximum depth of the grinder station basin shall be 12 feet.

6) Electrical Service for Sewage Lift Stations and Grinder Stations
   a) AmerenUE is the provider for electrical service. The owner, developer, or contractor shall make arrangements with AmerenUE for electrical service to the grinder station. Electrical energy shall be provided on a direct individually metered service of the appropriate capacity for the facility to be served.
   b) The use of "Add-a-Phase" or other artificial phasing devices is prohibited. When three phase service is required the owner or developer shall make all necessary arrangements with AmerenUE to provide the required service.

7) Grinder Station Electrical Panel: ABS / Electric Control Company shall provide the standard panel developed for the City of Osage Beach of the correct model to match the pump(s). The control panel shall be fully and completely compatible and parts interchangeable with existing city owned units or as directed by the City Engineer. It shall be mounted on galvanized steel rack at a height of approximately 5 feet above finished grade. Each control panel shall have a wiring diagram, or schematic,

attached to the inside of the outer door of the control panel box. All exterior wiring shall be run in rigid metal conduit. All work should be done in accordance with the National Electric Code and all material should be UL approved. The control rack shall be 24-inch frame width. Frame shall be 2 inch square steel tubing (#9 gauge minimum). All components shall be hot dip galvanized. Field cuts must be saw cut. Saw cuts shall be painted with Rust-Oleum or Galva-Well. Below grade metal components shall be painted with a minimum of two coats of Koppers Super Service (blk) Tenemec #450 Heavy Tenemecol coating/sealer, or approved equal. Legs shall be set in concrete. Concrete shall be a minimum of 18 inches deep and 12 inches in diameter. Electrical service wires, pump service wires, and float control wires, shall be run in minimum 2-inch galvanized rigid steel conduit. All bends and fittings shall be long radius bends. An explosion proof wye fitting shall be installed six inches below the control panel. No splice boxes will be permitted within the grinder pump basin. Riser for ground wire shall be in ½ inch rigid, galvanized steel, conduit with grounded bushings, with stubbed and bonding jumper.

8) Grounding Rod shall be copper clad grounding rod, ½ inch by 8 feet in length. The rod shall be driven vertically into the ground or as directed by the City Engineer.
9) Electric meter, meter base, disconnect, and panel shall comply with AmerenUE Service Manual, Section 5.3.1 (bypass requirements).
10) SCADA shall be provided by Systems Manufacturing, 14042 W 107th St. Lenexa, KS, 66215; phone (913) 485-3307.

REQUIRED INSPECTIONS, TESTING, AND STARTUP PROCEDURE

1. Construction Drawings are required for all gravity and pressure sewers and all grinder or sewage lift stations. Such drawings shall be designed and sealed by a Registered Professional Engineer in the State of Missouri.
2. All materials and equipment shall conform to the City of Osage Beach Design Guidelines.
3. All gravity and pressure sewers shall be inspected by Public Works Department Personnel prior to backfill.
4. All gravity and pressure sewers, manholes, and wetwells shall be tested for leakage as specified herein. All tests shall be performed in the presence of City personnel.
5. Grinder and sewage lift stations shall be fully tested for performance and operation in the presence of Public Works Department personnel. Such testing shall include pumping rates, pumping cycle tests including emergency alarm and startup of standby equipment (if so equipped), electrical current and voltage checks. The contractor / developer shall provide the services of a manufactures factory representatives to be present during the tests.
6. Upon completion of all testing startup procedures the Engineering Department will issue a certificate of acceptance. The system will not be connected to the city service or

accepted by the city until the acceptance certificate is issued. If the system can not be accepted no building occupancy permit will be issued.

AS CONSTRUCTED DRAWINGS AND MAINTENANCE DOCUMENTS

The Developer/Contractor shall provide the City Engineering Department with not less than two full sized "As Constructed" drawings certified as being correct record drawings by a Registered Professional Engineer.

The developer or contractor shall provide one copy of a certified and recorded utility easement for all sewerlines and grinder station sites to be turned over to the city. Easements shall be prepared and sealed by a Registered Land Surveyor in the State of Missouri.

TYPICAL DETAILS FOR SEWER APPURTENANCES

Sewer appurtenances shall conform to the Typical Details attached hereto.

PUBLIC INFORMATION PACKET – SEWER DESIGN

Applicants for a building or zoning permits will be provided with a "Sewer Information Packet" which reflects the requirements contained in this design manual and pertinent city ordinances. Such packet shall be considered as an approved part of the City Of Osage Beach Design Guideline.

SEPTIC TANK SYSTEMS

City Code Section 710.090 requires that any facility constructed within 300 feet of an existing city sewer must connect to such sewer. There are a few locations within the city where city sewer is not available. In those cases the owner may be authorized by the City Engineer to construct or repair a septic system.

REQUIREMENTS FOR AUTHORIZED PRIVATE SEWAGE DISPOSAL SYSTEMS

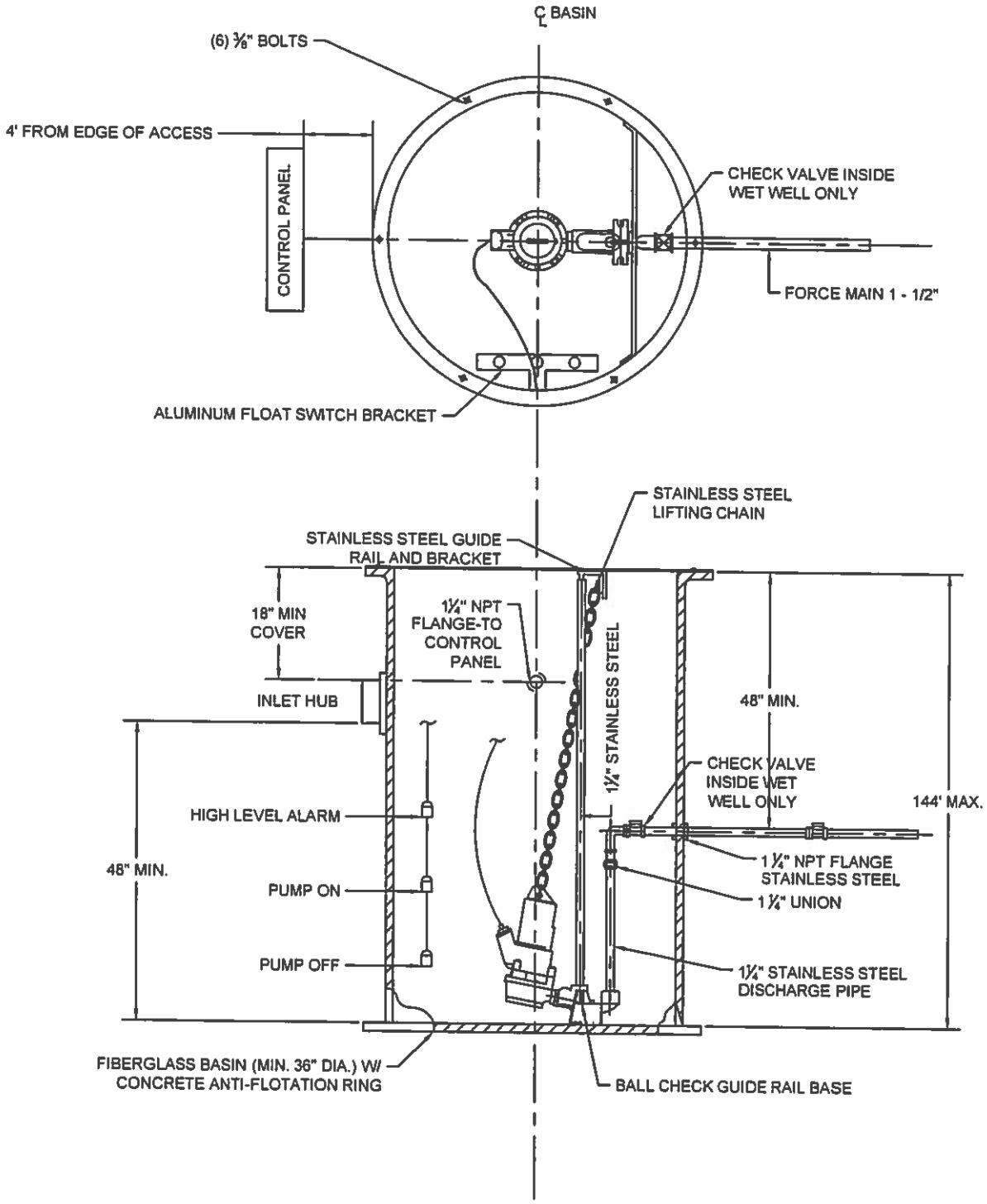
A Septic Tank Permit from the City Engineer is required prior to construction. Approved soil morphology, permeability tests and soil percolation tests, site topography, septic tank and absorption system, design by a registered professional engineer are required for the permit.

1. The system must be designed by a Registered Professional Engineer in accordance with Missouri Department of Health Regulations 710.025 through 710.059, Missouri Laws for On-site Sewage Disposal Systems, and 19 CSR 20-3.060 Minimum Standards for On-site Sewage Disposal Systems
2. Soil morphology, permeability tests and soil percolation tests shall be made by a registered professional engineer or state certified soil scientist. Tests and reports shall be in accordance with 19 CSR 20-3, Para (2) Site Evaluation.

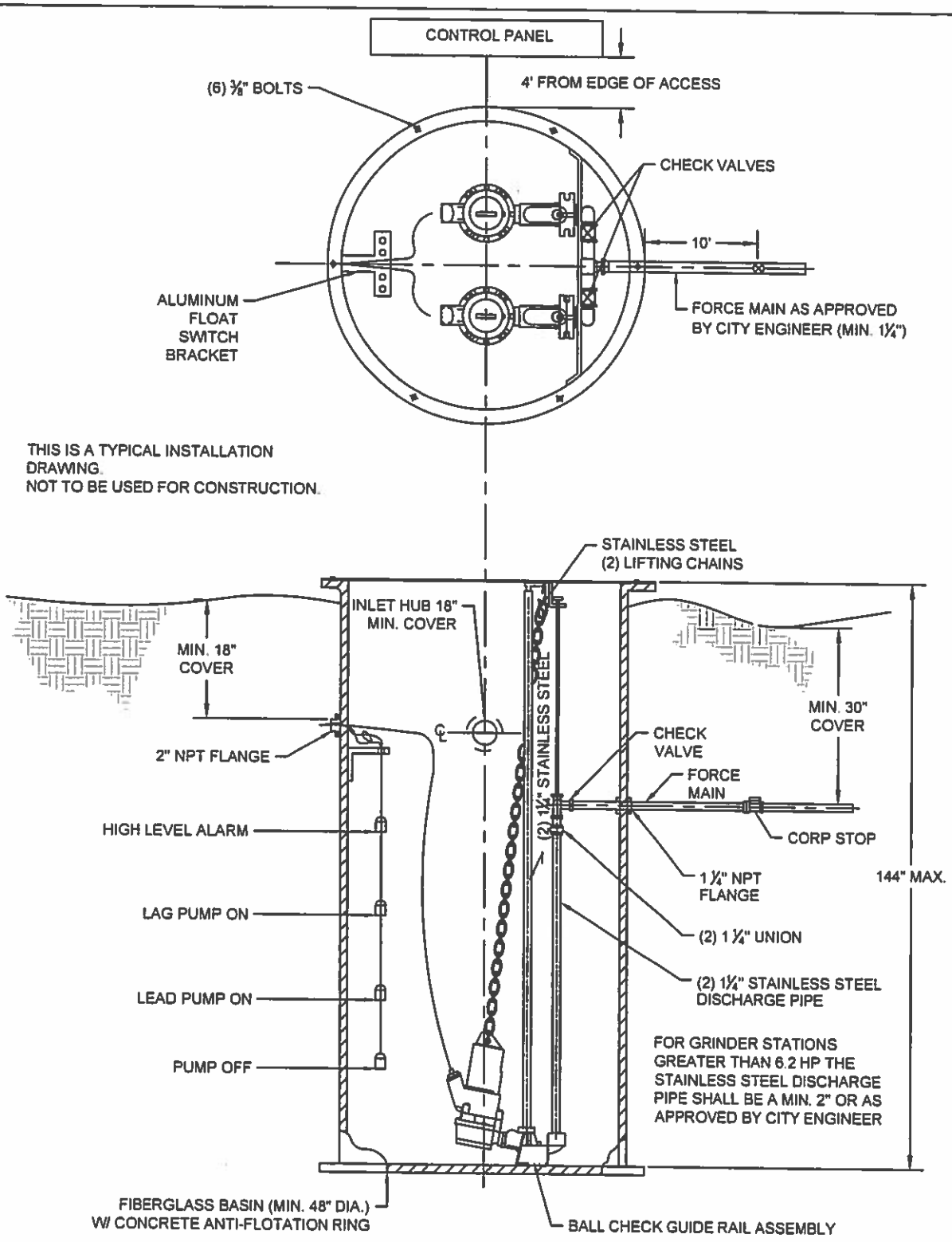
3. The Minimum Setback Distances shown in 19 CSR 20-3, Table 1 Minimum Setback Distances shall be strictly followed.
4. Flow Rates or Volumes shall be computed on the basis of 120 gal/day/bedroom or 60 gal/day/person, the minimum flow from a residence shall be 240 gal.
5. The minimum septic tank capacity shall be 1250 gallons. Septic tanks shall be constructed in strict conformance to 19 CSR 20-3, Para. (4).
6. Absorption Systems shall be in accordance with 19 CSR 20-3, Para. (5) Absorption Systems.
7. Alternative Systems shall be in accordance with 19 CSR 20-3, Para (6) Alternative Systems.

A Septic Tank Permit from the Public Works Director is required prior to construction. Approved soil morphology, permeability tests and soil percolation tests, site topography, septic tank and absorption system, design by a registered professional engineer are required for the permit.

END



Date Revised: JUNE, 2017	CITY OF OSAGE BEACH TYPICAL DETAIL SIMPLEX PUMP STATION	Design Guideline: SECTION 3
By: MLM		SEWERAGE DESIGN
Checked By: NLE		Drawing No.: III-7



Date Revised: JUNE, 2017	CITY OF OSAGE BEACH TYPICAL DETAIL DUPLEX PUMP STATION	Design Guideline: SECTION 3
By: MLM		SEWERAGE DESIGN
Checked By: NLE		Drawing No.: III-8