INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps. Each original is also photographed in one exposure and is included in reduced form at the back of the book.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.
Adaptive reuse of aircraft carriers

Pervanis, Athena, M.Arch.
Rice University, 1994
RICE UNIVERSITY

ADAPTIVE REUSE OF AIRCRAFT CARRIERS

by

ATHENA PERVANIS

A THESIS SUBMITTED
IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE
MASTER OF ARCHITECTURE

APPROVED, THESIS COMMITTEE

Gordon Wittenberg, Director
Associate Professor of Architecture

Richard Ingerson
Assistant Professor of Architecture

Basilios Poulos, Chairman
Art and Art History

Houston, Texas
April, 1994
ABSTRACT

Adaptive Reuse of Aircraft Carriers

by

Athena Pervanis

The modernization of the U.S. Naval fleet along with recent cuts in defense spending, have led to a number of vessels being decommissioned. This, coupled with the need for additional detention facilities, has led to the proposal contained herein, where decommissioned seafaring vessels, specifically aircraft carriers, instead of being broken up, are modified and adapted to serve as correctional facilities.
Acknowledgments

A number of people have made this project possible. My advisors Gordon Wittenberg, Richard Ingersoll, and Bas Poulos deserve special thanks for their guidance. I am also most appreciative of the assistance of John Taylor, Design Program Coordinator of the Texas Department of Corrections, Construction Division, for his invaluable comments, corrections and suggestions. I am grateful to YNC. Marc S. Gammons, USN, of Rice University's Navy ROTC, who was instrumental in my locating the documents of the USS Lexington and to Tom Ewart, Curator, and Margaret Wead, Assistant Curator of the USS Lexington, who very kindly gave me access to the deck plans of the vessel. I would also like to thank Leon Root, Chief of Maintenance of the USS Lexington, for his most helpful insights into the practical aspects of the project. And, of course, my many thanks to Kathleen Roberts and Elaine Sebring for their continuous encouragement in countless ways, big and small, towards the completion of my thesis. Finally, my parents deserve special thanks for their patience and moral support.
Contents

Acknowledgments

List of Drawings
Foreword
Introduction

Chapter 1 Aircraft Carrier Design and Construction
1. Unique Nature of Ship Structures
2. Ship Structural Components

Chapter 2 Felony Substance Abuse Treatment Facilities
1. The Theoretical Basis of the Drug Abuse Treatment Unit
2. Programmatic Requirements

Chapter 3 USS Lexington
Design Proposal

Glossary

Bibliography

Appendix

USS Lexington: Deck Plans With Structural Bulkheads
USS Lexington: Modified Deck Plans
Details
List of Drawings

Deck Reinforcement @ Opening .............................................. 13

**USS Lexington: Deck Plans w/ Structural Bulkheads**
Level 03 (Flight Deck) ...................................................... 41
Level 02 (Gallery Deck) ..................................................... 42
Level 01 ............................................................................. 42
Level 00 (Hangar Deck) ...................................................... 43
Level 2 .............................................................................. 43
Level 3 .............................................................................. 44
Level 4 .............................................................................. 44
Level 5 (1st Platform) ......................................................... 45
Level 2 (existing partition layout) ........................................ 45

**USS Lexington: Modified Deck Plans**
Outboard Profile (Starboard) ............................................... 47
Outboard Profile (Port Side) ................................................ 48
Inboard Profile ................................................................... 49
Level 03 (Flight Deck) ....................................................... 50
Level 02 (Gallery Deck).......................................................... 51
Level 01................................................................................. 52
Level 00 (Hangar Deck).......................................................... 53
Level 2..................................................................................... 54
Level 3..................................................................................... 55
Level 4..................................................................................... 56
Cross Section, Looking Forward
(below HD @ Fr. 111/112, above HD @ Fr. 142/143)................. 57
Transverse Section, looking towards Port
(between Frames 67/138).......................................................... 58

Details
Cell Wall Construction (plan)............................................... 60
Cell Wall Construction (section)............................................ 61
Cable Fastening @ Top of Column........................................ 62
Cable Fastening @ Top of Column........................................ 63
Floor Framing (plan)............................................................... 64
Floor Framing @ 1st Floor and Level 00................................. 65
Floor Framing @ 2nd Floor and Level 02......................... 66
Floor Framing @ 3rd Floor and Level 03............................. 67
Floor Framing @ Roof............................................................. 68
Bulkhead Replacement......................................................... 69
Cell Balcony........................................................................... 70
Before introducing this proposal it should be noted that the writer's intention is to preserve, as much as possible, the integrity of the vessel, tempting as it might be to conjure images of a "Carrier Ranch" (Cadillac Ranch, Amarillo, Texas). It is more than likely that the vessel will be permanently docked, possibly even sunk in mud, thereby not truly acting as a ship in water would, nevertheless, an awareness of the fundamental principles of naval architecture and warship construction is deemed necessary and therefore they are put forth in the First Chapter. The Second Chapter discusses substance abuse treatment facilities modeled on therapeutic communities, the part that they play in ameliorating the causative factors resulting in arrest and detention, along with program requirements for such facilities. Finally, the Third Chapter discusses specifically the aircraft carrier USS Lexington and how she could be modified to serve as a Felony Substance Abuse Treatment Facility. Drawings are included to suggest how such a proposal could be implemented. ¹

¹ The choice of the Lexington should not in any way imply a dissatisfaction with her current mission. Any of the five other decommissioned carriers could have been chosen to demonstrate this proposal. Convenience and ease of accessibility were the sole reasons behind the selection of the USS Lexington for this proposal.
Introduction

The first response to this thesis was "Wow!", which was followed by a "Why?" Requesting a ship to perform a function other than the one it was designed for seems at first rather unusual. The design of ships is so function driven and seemingly inflexible, that any attempt to alter them, and have them perform another function would seem to be futile. A more promising enterprise might perhaps be to rework a warehouse, an old mill or factory, which, having outgrown its original purpose, could be adapted to serve a new function. However, there exist other nontraditional, 'structures,' namely warships, which, at some point in their lifetime, are also 'retired.' In the past these titans, would have been stripped of all their military ecoutriments, and either used as testing platforms or broken up, i.e., sold for scrap metal; extreme pacifists might even argue that they should be pulverized! However, one must keep in mind that scrapping Navy vessels is also a very costly enterprise. Sorry, no wrecker balls or dynamite here!
One solution would be to propose that precisely for the reason that these vessels cost millions to build, they should not be broken up. In an age of continually diminishing resources, would not an efficient solution be — although perhaps still costly — to adapt and not scrap? One could thus argue that instead of spending capital for their demolishment, that same capital could be invested into modifications and alterations of the vessels, which could then still serve a purpose, albeit a much different one. (Another solution would be, rather than mothball these carriers, the U.S. could sell them to Allies overseas and use the proceeds to develop and/or buy newer versions.)

The decision to choose an aircraft carrier over destroyer or battle cruiser, for example, was based purely on 'numbers' -- namely square footage. Even though any of the Navy's larger vessels could be adapted, aircraft carriers, due to their function and size, offer the most flexibility. They are impressively large vessels and can quite literally be compared to floating cities, of the 'medieval' type — complete with meandering streets and tightly-knit living quarters. Recently, five carriers have been put out of active service: Midway, Coral Sea, Forrestal, Saratoga, and Ranger, while the Lexington now serves as a carrier museum in Corpus Christi, Texas.

---

1 (In millions of dollars) Midway (1945) $85.6; Coral Sea (1947) $87.6; Forrestal (1955) $168.9; Saratoga (1956) $213.9; Ranger (1957) $173.3. (Commission date in parenthesis)
2 These along with other vessels previously decommissioned are part of a reserve fleet colloquially known as a "mothballed fleet."
3 Refer to Norman Friedman, "U.S. Aircraft Carriers," Vital Statistics of Carrier Types, pp. 412-418, for a complete listing of carriers along with their fates.
Carriers could house any number of facilities. They could serve as job retraining centers, housing for the homeless, trade schools, education centers, traveling disaster relief centers,...

This proposal examines the possibility of the USS Lexington serving as a detention facility treating substance abusers. The majority of inmates in U.S. federal prisons today are drug offenders, and recently there has been a shift towards the "rehabilitation" and not merely the "detention" aspect of prisons for these offenders, in the belief that treatment of this segment of the inmate population would provide a solution to the current overcrowding of our facilities while simultaneously reducing recidivism rates. The decision to pair the carrier with such a program was prompted by the fact that ships provide a secure perimeter as well as an enclosed, protected environment that lends itself to such an application.

Aesthetically and programmatically, however, detention facilities have rarely been welcome additions to the landscape: their very function -- to isolate dangerous people from the rest of society -- works against any easy blending into their surroundings, and thus these facilities, (whether this is true or false) have acquired a reputation for being rather ungainly edifices. Much progress, however, has recently been made to give them an appearance that is unobtrusive and that "blends in" with the surrounding environment. (For example, few on first glance would identify the Suffolk County Jail overlooking the Charles River in downtown Boston Massachusetts as a detention facility.) A carrier, thus, not

---

4 In 1970, 16 per cent of the inmates in federal prisons were there because of drug-related offenses. At present that number is up to 70 per cent. ABC News Nightline Crime and Punishment Issues and Politics #3308 Air Date: January 26, 1994.
belonging to any architectural -- in the sense of "building" -- type, offers the possibility of camouflaging a not very desirable institution. Ships provide a secure perimeter as well as an enclosed, protected environment, both pre-requisites for a detention facility. Additionally, one might add that there is a precedent for such a pairing, namely Roman galley ships.
Section 1
Unique Nature of Ship Structures

The geometry of a ship is unique, her structure complex: she consists for the most part of broad expanses of plating, stiffened by a variety of structural shapes. Additionally, the design of ships differs considerably from that of other structures: in 'all' structures the size of any structural member is properly proportioned to the stresses carried. If a building on land were to have its members overdesigned (larger than necessary and/or more than necessary columns, for example), larger foundations would be required to compensate for the additional weight. A number of problems, however, arise, if the members of a ship are overdesigned: firstly, there would be obvious objection to the unnecessary weight (less room for cargo, less reserve fuel,...) and secondly, redundant strength results in the tendency of a stronger member to shirk its load and transfer it to an adjacent weaker member thereby possibly overstressing it. Therefore, the structural members of a vessel are only as large as required and no larger and the weight of the ship is kept as low as possible. Additionally, optimum distribution of materials is more important in ship design than in some other
structures. And unlike many structures, to which known dead and live loads can be applied with reasonable accuracy, the most critical loading on the ship's structure is imposed by the sea, whose magnitude, however, is uncertain. The sea loading is made even more complex by the motions of the ship in response to the loading from the sea. And while the ship is designed to have the strength to withstand all expected loadings, the stiffness of the structure also imposes constraints on her form.

Section 2
Ship Structural Components

Aircraft carriers, structurally, are very similar to other large (navy) vessels, the only difference being the existence of the flight deck, which unavoidably alters the arrangement of some of her structural components. The first carriers were nothing other than converted merchant hulls and battle cruisers with flight decks slapped on to them. As designs improved and as the mission of carriers expanded, their flight deck was built as a part of the hull, its forward end being faired into it thereby providing the pronounced flare that modern carriers are known for. With the advent of the angled flight deck, the portion of the hull under it -- needed to support the overhanging deck -- was also incorporated into the port side of the hull.

Structurally a carrier (as well as any other ship) may be considered a box girder: the strength deck is the upper flange ¹, the ship's bottom is the lower

¹ Strength decks could either be the Hangar/Main deck and/or the Flight deck.
flange, and the side plating is the web. When the ship is afloat there is a tendency for this structure to distort, therefore it must be rigidly built. The remaining structural members of the hull, such as the framing (including the stem and sternpost) the shell and inner bottom plating, bulkheads and decks, also contribute directly or indirectly, to the structure of the ship, by maintaining the main members in position so that they can act efficiently. The framing is the skeleton of transverse ribs and longitudinal frames to which the shell plating is attached; (in appearance and function, the framing of a ship is not unlike the framework of a building on shore.) The shell plating is rigidly secured to all decks as well as to the bottom and is a very important member of the hull structure since it contributes materially to the structure of the ship by forming three sides of the box girder. Finally, bulkheads stiffen the entire hull structure which otherwise would be too flexible.

**Framing.** In carriers a combination of framing systems is used: The bottom and deck plating are longitudinally framed while a combination of longitudinal and transverse framing is used on the sides. In longitudinal framing the

---

2 Racking is the result of torsional hull distortion and is caused either by dynamic loads due to rolling of the ship or by the transverse impact of seas against the topsides. Bulkheads prevent racking if the bulkhead spacing is close enough to prevent deflection of the shell or deck plating in its own plane. When a ship is in "hoggimg" condition, the deck is in tension and the bottom plating in compression, when in sagging condition the reverse is true. When a ship is floating among waves, she passes from hoggimg condition to sagging every half a wave length. In other words, there are two reversals of stresses throughout the entire structure in the time required for the wave to move one wave length. This reversal of stress in a steel ship is not apparent to anyone on board, but the structure must be rigidly built to resist this ever present tendency to distortion. The side plating is rigidly secured to the bottom and deck plating, but, while the deck and bottom plating have a practically uniform stress all the way across any section, the stress in the side plating is uniformly varying. In hoggimg condition the plating near the top is in tension which decreases becoming zero at the neutral axis. Below the neutral axis the side plating is in compression.
frames which stiffen and support the shell and inner-bottom plating, and the beams which stiffen and support the decks, are run longitudinally through transverse bulkheads and therefore they contribute in large part to the strength of the hull girder and thus assist in resisting the longitudinal bending of the ship's hull. The 'lattice' of longitudinals and transverses used on the shell makes for better stiffening: the longitudinal frames aid in resisting longitudinal bending of the hull while greatly increasing the critical compressive buckling strength of the plating to which they are attached, and the closely spaced ribs girding the ship stiffen the shell and plating. For the majority of the carrier's length, the frames are simple T-bars, spaced 4 feet vertically and horizontally, their web welded to the side plating. At the forward end of the carrier, however, due to the bow's flare and thus to the concentration of stresses in this portion of the vessel, they become heavier, built-up sections, spaced 2 feet vertically and horizontally.

**Bottom Plating and Inner Bottom.** The bottom plating is the ship's principle longitudinal member constituting the lower flange of the hull girder.

The inner bottom is a water tight covering laid on top of the bottom framing. It forms, with the shell plating and framing, the space known as the double or triple bottom (if there are two layers of framing). It acts as a second water tight member which in case of damage to the bottom plating, confines the flooding to a small volume and thus preserves the buoyancy of the ship. It is divided into a number of compartments, and extends longitudinally over the greater part of the length of the hull, and transversely to about the turn of the bilge. It also makes a significant contribution to the strength of the lower flange: inner bottom and bottom shell, together with their floors and girders, work as a double- (or triple-)


plate-panel to distribute to the main supporting boundaries (bulkheads and side shell) the secondary bending effects caused by hydrostatic and cargo loads.

**Shell.** The shell is one of the most important strength members of the hull forming the bottom flange and the webs of the box girder; it is subject to static water pressures, as well as the dynamic effects of pitching, rolling and wave actions.

Shell plating is worked in fore-and-aft rows called strakes. The connection between plates in adjoining strakes is a seam, that between adjoining plates in the same strake, a butt. The top row of side plating is called the sheer strake and the curved plating at the turn of the bilge, the bilge strake. Structurally, bilge strakes transform the tensile stresses of the deck and bottom to longitudinal shear in the sides and therefore are subjected to larger stresses. As a result, they are usually heavier than the other shell plating. ³

**Decks.** The decks divide the space within the hull into a number of horizontal layers. One or more strength decks form the upper flange of the box girder. The remaining decks, depending on their extent in the longitudinal direction, their distance from the neutral axis of the hull, and their effective attachment to the main hull, contribute to a greater or lesser degree in resisting the longitudinal bending loads.

³ Each shell plate below water is subject to the load of the external water pressure, in addition to the tension or compression it is subject to due to the tendency to longitudinal bending in the ship girder. The thickness of the plating is based on these stresses plus a margin for deterioration by corrosion.
All decks are water tight and they generally extend the full width of the ship, but not necessarily the full length. A partial deck is known as a platform or flat. Similar to side plating, the deck structure also consists of plates laid in strakes, fore and aft, supported by transverse deck beams, which, in turn, are secured to the frames by triangular brackets. To increase the compression strength of a structural deck, longitudinal frames, called deck girders, are worked under the deck. The outboard strake of deck plating, is known as the deck stringer, and is heavier than the other strakes. Frequently, openings are made in a deck in which case the stresses are carried by the outboard two strakes of plating; it is necessary therefore that these remain intact.

**Bulkheads.** Bulkheads, are one of the major components of a ship's internal structure and serve three important purposes, depending on their orientation and extent. Similarly to frames, they stiffen the hull structure by acting as diaphragms for the box girder, thereby resisting in-plane torsional and racking loads, while simultaneously compelling the shell to retain its shape against the external water pressure. Secondly, they help to distribute the structural weights and the forces of buoyancy throughout the structure. (In dry dock, when the ship is supported on very small areas of the bottom, practically all of the weight of the ship hangs on the structural bulkheads.) Transverse bulkheads, however, do not contribute directly to longitudinal strength, as longitudinal bulkheads do, the latter being almost as effective as the side shell. Thirdly, bulkheads are partitions and therefore prevent progressive flooding. They also serve in many cases as part of the ship's protective system against shell fire and under-water explosion. Bulkheads which are a structural part of the ship girder are called structural or
strength bulkheads, they extend from the inner bottom to the strength deck and like the shell are usually formed of strakes of plating; those which act solely as partitions, partition or non-structural bulkheads; those which are part of the protective system, protective or splinter bulkheads; the light partitions which are fitted in large oil and water tanks to obstruct the free flow of the liquid and thus prevent damage to the boundaries by dynamic effects of fluid set in motion are known as swash bulkheads, the latter being most effective when the tanks are 2/3 full.

Stiffeners or Frames. Shell plating, decks and bulkheads are basically large sheets of plate whose thicknesses are very small in comparison to their other dimensions. These plates carry loads both in and normal (perpendicular) to their plane. They may be flat or curved, but in either case they must be stiffened in order to perform their function efficiently. In the case of loads normal to the plate (such as fluid loading on a transverse bulkhead) the stiffeners provide edge restraint for the plate. In the case of in-plane loads (such as those caused in the deck by longitudinal bending of the hull girder) the stiffeners (beams) serve to maintain the (deck) plating in its designed shape. The stiffening members are generally rolled, extruded, flanged, flat, or built-up plate sections with one edge attached to the plate they reinforce.

Decks, side shell, inner bottom, bottom and bulkheads all act as stiffeners providing edge restraint for each other. The beams stiffen the deck plating. The girders, in turn support the beams, transferring the load to the pillars or bulkheads. The side frames of a ship help to resist loads applied to the outside of the shell, thereby keeping it in its proper form against the tremendous water pres-
sure; they also serve to stiffen the side plating against buckling when the plating is in compression; and finally, the side frames also distribute local stresses to other structural members: the transverse frames transmit weights on the decks down to the bottom where these weights are neutralized by the force of buoyancy.

Structural bulkheads must also be able to withstand fluid pressure; thus, like shell plating, they are supported by stiffeners. The size of the stiffeners depends upon their spacing, the height of the bulkhead, and the hydrostatic pressure the bulkhead is designed to withstand. At top and bottom and at any intermediate decks, these stiffeners are secured by brackets. Sometimes, corrugated bulkheads are used, the corrugations acting as stiffeners.

Non-structural bulkheads, however, are usually not fitted with stiffeners. Constructed of light plate, wire, mesh or corrugated steel or aluminum, they are used solely to separate diverse activities, are limited to one deck in height, are non-water tight and are not included in the strength calculations of the ship.

**Openings.** When openings are made in decks, bulkheads or other stiffening members, such as beams and girders, these openings should be made with rounded corners.\(^4\) Square-cornered cuts are an invitation to failure due to stress concentration. (When a deck is severely stressed, failure always starts at the corner of an opening.)

---

\(^4\) A radius equal to one-eighth of the dimension of the opening perpendicular to the stress is good practice, but for large openings, 2ft (610 mm) is usually acceptable.
Openings should be reinforced either by doubling plates, in the plane of the plates, or flat bar rings welded around the periphery of the opening and normal to the plane of the plate. Both are a useful way of reinforcing openings that are made as a modification to the existing structure. Doubling plates compensate for the material lost and extend outboard from the edge of the opening to each side a distance equal to one-half the width of the opening. The flat bar reinforcement is more convenient from a construction standpoint, since it is much easier to add a flat bar than an insert plate when a hole is made in a completed area of the deck or shell. The flat bar is, however, a tripping hazard in some areas. When openings are so large that they require the cutting of deck beams, the interrupted beams are riveted to a fore-and-aft frame, called a carling, which extends between the uncut beams, and transmits the loads from the cut beams to the adjacent uncut ones. (Fig. 1).

![Diagram of deck reinforcement at opening]

Fig. 1 Deck Reinforcement at Opening
Expansion Joints. Finally, a feature which one might not expect to find in a sea-faring structure is the expansion joint. It creates a deliberate discontinuity; its purpose is to change the upper part of the vessel into a series of short parts which will not behave to the same extent as an integral part of the hull girder in bending, thereby allowing more flexibility.
Section 1

Overview

The Theoretical Basis of the Drug Abuse Treatment Unit

Research conducted over the past decade has shown that drug use by criminal offenders today far exceeds that of the general population. In recent drug testing conducted across the U.S. it was found that three out of every four arrestees tested positive for one or more illegal drugs. Most chronic offenders habitually abuse alcohol and other drugs, the level of criminal behavior being proportionate to the level of drug abuse.

It is ironic that our prisons are supposed to be correctional institutions because rehabilitation has to a great extent fallen into disrepute as an operational goal. Most of our detention facilities are already stuffed to the seams and

---

3 Ibid., p.1.
4 Chaiken, 1989, p.2.
Over 50 per cent of all inmates in prisons were regularly involved in using drugs before their last arrest but were receiving no programmatic help while incarcerated. (Ibid., p.vii).
that additional cells are necessary to relieve the overcrowded conditions present there, however, with the relationship between drug use and criminal behavior being what it is, mere warehousing of persistent drug-involved offenders only results in the intensification of the already vicious cycle of drugs, crime and incarceration. Without effective in-prison programs, released drug-involved offenders are back out on the streets committing many more crimes. A great number of them have been cycling repeatedly through detention facilities since they were adolescents and to release them into society without changing their patterns of behavior is to do a great disservice to public interest. Parole does not necessarily deter them because they are entrenched in a lifestyle that includes drugs and crime, and, as research suggests, these highest-rate, most dangerous, drug-involved offenders typically escape supervision.⁶ (Thus, the growing understanding of the relationship between drug use and crime has led to the growing recognition of the need for in-prison drug abuse programs.)

Most drug treatment programs (in or out of prisons) can be classified into four modal categories: detoxification, methadone maintenance, outpatient drug-free and residential.⁶ Detoxification programs provide medical and psychological services for substance abusers undergoing staged withdrawal from physical dependency on drugs. Methadone maintenance programs provide addicts with chemical substitutes for heroin in a legally and medically controlled environment. Individual or group counseling is almost always provided along with methadone

maintenance. 7 Outpatient drug-free programs provide counseling and other services in settings including store-front clinics, mental health clinics and hospitals. Residential programs provide counseling and other services in hospitals, free-standing facilities and correctional facilities. 8

In comparison to other residential treatment facilities, prison programs provide fewer services. Prison drug treatment programs are much less likely to include job counseling, vocational rehabilitation and education, and while over 80 per cent of other residential programs incorporate family therapy or counseling, only 41 per cent of prison programs have provided this service. Additionally, the majority of outside residential program staff provide referral to treatment services and aftercare follow-up, however fewer than 65 per cent of prison program staff provide referral and fewer than 27 per cent maintain contact after release. 9

Researchers in the past have questioned whether penal treatment can change the behavior of drug-involved offenders. However, is it truly that "nothing works," 10 or are there justifiable reasons to be optimistic about rehabilitation?

7 NIDA, op. cit.
Some effective programs do exist for the incorrigible. A handful of correctional institutions have implemented an innovative yet still experimental substance abuse program for rehabilitating hard-core recidivists.\(^{11}\) The program operates within the structure of a therapeutic community — one of the most common forms of free-standing residential programs — and is based on the methods and techniques of understanding and altering the criminal personality developed by Dr. Samuel Yochelson and Dr. Stanton E. Samenow.\(^{12}\)

---

\(^{11}\) One such program is the Drug Abuse Treatment Unit (DATU) operated by the Wisconsin Department of Corrections. The first prison-based therapeutic community for treatment of criminal offenders was begun in 1961 at the Nevada State Penitentiary in Carson City. In 1977, the Stay'n Out prison-based drug treatment program was begun in the Arthur Kill medium security institution on Staten Island in New York City. Amity Inc. was started in 1969 and currently provides 18 separate substance abuse programs in four localities: Tucson, Phoenix, Payson (Arizona), and San Diego, California (Amity RighTurn). Other prison programs for drug-involved offenders which reported low recidivism rates are the Cornerstone Program, Oregon, 1976, Lantana Program, Florida, 1974, (converted to a facility for women offenders in January 1989), and Simon Fraser University Program, British Columbia, 1972. For more on these programs refer to: Gary Field, "The Cornerstone Program: A client outcome study," \textit{Federal Probation}, June 1985: 50-55.


\(^{12}\) Dr. Yochelson was a psychiatrist who dedicated his career to understanding and altering criminal behavior patterns. He and his protege, clinical psychologist Stanton E. Samenow, worked at St. Elizabeth's Hospital, a large psychiatric facility in Washington, DC. Their approach is detailed in a three-volume work, \textit{The Criminal Personality}. Northvale, N.J.: Jason Aronson Inc., 1976.
Yochelson and Samenow focused on observing, understanding and changing criminal behavior. In their view drugs do not cause a person to commit a criminal act, but rather

"[they] simply make it more feasible for him to eliminate fears for the time being in order to act upon what he has previously considered. That is, drugs intensify and bring out tendencies already present within the individual user ... The criminality comes first, the decision to use drugs later." 13

Prison simply puts a damper on habitual offenders' criminal careers; their plans are temporarily "put on hold" when they are caught, and once they are released they resume their criminal behavior. Therefore, it is useless to simply incarcerate these hard-core recidivists without intervention. The only way to change criminal behavior is to change the individual criminal's thought process, that is, change his thinking pattern.

"... He must be taught new thinking patterns that are self-evident and automatic for responsible people, but are totally foreign to him." 14

And Dr. Samenow is quick to point out that his techniques are not coercive:

"Change is possible only when a criminal makes a choice to participate in a program like [this], when he is fed up with himself and consents to expose

13 The Criminal Personality, op. cit., p.128
14 Ibid., p. 6.
his thinking to criticism and correction. In this program, decisions are not made for the criminal. [...] A criminal maintains his own political and religious views, his aesthetic tastes and interests ... Nothing in this program imposes a life style or value of a particular social class ... In short, the change process calls for the criminal to acquire moral values that have enables civilizations to survive. The objective is to teach them to live without injuring others."  

The goal of the program is to render a complete about-face in the criminal's lifestyle by replacing anti-social with pro-social behavior: abstinence from drugs is coupled with the development of positive attitudes, values and behavior. This is an arduous task since potential participants in this program tend to have lengthy criminal histories that include serious crimes — murder, rape, armed robbery, along with a number of other felonies. These are the men that the justice system describes as "predatory," "high-rate offenders," and "career criminals."  

Participation in the program is strictly voluntary. A series of interviews and tests (psychological and educational achievement tests) are conducted, designed to develop a profile of the participants treatment needs. This is necessary

---

15 Ibid, p.252.
16 Willoughby, p.7.

Their drug habits tend to be expensive -- habits of $1,000 a day or more prior to arrest are common. Many have a past or current addiction to cocaine or heroin, and most have an extensive drug history or polydrug use. Almost all of them have been in traditional treatment programs, to no effect. Ibid., p.7.

Clients often display behavior that might lead them to be classified as character disordered or psychopaths. Prominent among these features are egocentricity, impulsivity, sensation-seeking, low frustration tolerance, lack of empathy for others, and an apparent inability to learn from their mistakes. However, they must not exhibit severe psychiatric disorders (such as schizophrenia or manic depressive illnesses) or neuro-psychiatric disabilities (such as mental retardation, head injuries, or epilepsy.) Ibid., p.7.
to make sure that they fit the parameters of the program. Not everyone desiring so is admitted, and furthermore, many of those eligible for the program refuse treatment. There are also those who, shortly after their acceptance, realize that this is not a place to do "easy time" and ask for a transfer. Finally, those who are accepted are also not forced to stay; they can terminate their treatment at any time and return to the general prison population. Once accepted, the inmate is kept in the program either until he succeeds in changing his thoughts and behavior patterns, or until he proves otherwise by demonstrating an unwillingness to participate. It is undeniably an intense program, confrontational and very demanding, and entails not only the client's full cooperation, but also his total commitment and willingness to work hard emotionally, and mentally. Not surprisingly, many of those who enter the program do not succeed in graduating, however, those who successfully complete it also leave behind their criminal behavior and become responsible, law-abiding citizens.

Unlike many prison based substance abuse treatment programs where inmates may spend an hour or two a week in meetings, this program demands a significant contribution from each of the participants, working on the assumption that there is a greater chance of changing behavior if the program were to occupy all hours the residents are not involved in other basic activities, such as eating, sleeping or carrying out work assignments. In order to change his think-

17 Many do -- for the Wisconsin DATU the dropout rate is approximately 45 per cent. Most of those who drop out do so within days of entering the program, since most of those who enter are motivated by a desire to get out of prison rather than by an interest in changing their behavior. However, the program is intense in its confrontational approach and little room is left for the residents to manipulate the staff or other residents or fake participation. Many quickly conclude that this program is not for them and ask for a transfer. Willoughby, p.8.
ing pattern the criminal learns to honestly face himself, think about, and become aware of his thinking. This is achieved by keeping a daily record of all of his thoughts, which is then shared with others in group meetings. The next step is for the criminal to learn to distinguish functional thoughts from dysfunctional ones. Once he has learned to acknowledge, accept and articulate these thoughts, he can begin, not only to correct them, but also learn to deter them. When the inmate has proven that he is able to consistently deter his entrenched criminal thought pattern and understands that he is responsible for his thoughts and his actions, he is able to re-enter society.

Thus, instead of merely attempting to persuade the participants to give up drugs, the intent of the program is to demolish old and entrenched thinking patterns and lay a new foundation by teaching new concepts. It provides them with opportunities to learn more responsible and constructive behavior patterns, along with alternative, meaningful and personally gratifying ways of spending their leisure time. 18

There are no official "follow-up" procedures. 19 The criterion for success is that the graduates stay out of prison. The only practical measure of success is whether or not these former inmates re-enter the prison system. To take the Wisconsin DATU as an example it is a successful system: 76 per cent of the 67

---

18 Chaiken, 1989, p.15.
19 However, most of the graduates stay in contact with the social workers for several years after they leave the unit. They call to report success in finding and keeping jobs and to get advice when they encounter problems. Willoughby, p.14.
men who graduated from the program between July 1982 and January 1988 had not returned to prison in Wisconsin as of January 1989. And as far as Cornerstone, Lantana, Simon Fraser University, and Stay'n Out Programs, all dealing with previously serious offenders, are concerned, their recidivism rates were as low as 16 per cent.  

---

Section 2:

Programmatic Requirements **

Description

The project will consist of a 750 bed facility. Duration of sentence will be up to 12 months, with 6 months probably being the average length of stay.

Requirements

**Perimeter Security** Penetrations of the perimeter will be limited to pedestrian access at Administration and vehicular access at the sallyport. All residents will be searched and processed at facilities provided at the sallyport.

**Receiving/Release** A sallyported gate for vehicular traffic will be required, along with a minimal area for detaining residents, identification, uniform clothing exchange and storage for small personal property (i.e., watches, rings, etc.). This area should be located near the Medical facility.

**Unit Administration** Administration requires office space for assistants, secretarial support, records, reception, filing, conference rooms, secure file

** The programmatic requirements outlined here are based on the ones proposed by the Texas Criminal Justice Planning Workshop meeting on 28 February 1992, in San Antonio, Texas, and later submitted by Mr. Silverman in March of 1992. As the site for the proposed Felony Substance Abuse Treatment Facility is nontraditional, certain allowances and modifications of the program will necessarily have to be made once the program is applied to the vessel.**
storage, open work area and special work areas such as a mail room where all incoming and outgoing mail is sorted and processed.

Unit administration accommodates public access. Visitors will be processed at the entrance lobby. The Administration facility is accessible to residents for interviews or visitation through the Central Control sallyport.

Lobby and reception areas should be located immediately inside the entry doors of Administration. This area is not intended for use as an resident visitor waiting area; resident visitors, once processed, will continue directly to the visitation area.

**Treatment Administration**  
Treatment Administration requires office space for treatment staff (psychologists, counselors, possibly even probation officers), as well as a secure file storage for the residents' records.

Required spaces for the residents include classrooms, and group and individual counseling space, (in addition to that provided at Housing).

**Security (Line) Administration**  
Office space should be provided for primary security supervisors, compliance officers, grievance officers, disciplinary classification and clerical support staff. Space will also be required for interview rooms, secure property and evidence storage, disciplinary hearing room and classification hearing room, as well as a general office space.

**Central Control**  
This does not need to be the traditional central control, however it should be moderately secured and located near or at the visitors/staff entrance; it can operate as a reception area as well. Central Control will monitor and operate the vehicular gate entry, front door and other areas of the
facility under their supervision. Doors to living units, will be operated at the units themselves.

**Housing** This is to be set up as dormitory style housing containing a variety of differing size dormitory configurations. Each Housing Unit will be comprised of a number of 'communities', with upper and lower level housing. Each community will have a mix of dormitory rooms including four-man, six-man, eight-man rooms, some two-man rooms, as well as a 56 person dorm room. Dayroom and hygiene areas should be provided for each community, as well as areas for individual, group counseling and treatment. For security purposes, each community may be locked off from each other, however, it is intended that these operate together within each Housing Unit, thereby allowing movement between dayroom areas for shared activities. Pantry and janitorial spaces should also be provided for.

**Visitation** A variety of areas should be provided to accommodate contact and non-contact visitation, as well as attorney visits.

Visitors will enter the facility at the main entrance and the processing officer will check visitors. Processing will include: checking the approved visitation list, registering the visitor and verifying the latter's identification. Personal items will not be allowed beyond this point. Once processed, an officer will direct visitors to the visitation waiting area.

When notified of visits, residents will proceed to the Administration facility and pass through the control area into the shakedown area. All residents before and after visits, will be subject to searches to insure no contraband pass through the visitation areas.
**Academic and Vocational Education**  
Academic facilities include classrooms, a general library (stacks and reading room), a law library (stacks and reading room), clerical area, administrative offices, counselor offices, staff workspace, book and supply storage, and student break areas.

The academic program includes basic literacy training. The residents who need a high-school diploma to pursue further educational opportunities and to gain employment will be provided instruction and General Educational Development (GED) tests will be administered as necessary. Residents successfully completing these tests will be awarded a high school equivalency diploma. Training in social and civic skills will be offered to residents to aid them in their successful re-integration into society.

Vocational education will be provided to train those residents who need marketable skills in occupational fields where there is a high demand for workers. In addition to job specific skills, the resident will be offered occupational counseling and small business training.

**Food Service**  
Three meals per day will be prepared and served to the entire resident population. The food will be cooked at the Central Kitchen and transported to the Housing Units where it will be re-heated and served. Medical populations will be fed in the Medical facility. A separate dining area for the staff will provide the same food as served to the resident.

The Central Kitchen facility will include a central food preparation area, bakery, meat preparation, scullery for kitchen utensils, and storage facilities for dry, refrigerated and frozen foods.
**Medical Facility**  This will provide outpatient services to the resident population. Facilities include all basic health care needs on a day-to-day basis, as well as ambulatory care. Space should be provided for physician's offices, a U/A technician, exam and basic laboratory areas, a pharmacy, as well as the necessary support functions. A number of cells or rooms need to be provided for those residents assigned to quarantine.

**Mental Health**  This will be part of the treatment program, but there will be no provisions for acute psychotic or long-term forensic care.

**Armory/Locksmith**  No space is contemplated at these facilities.

**Assessment**  Assessment of the residents regarding their eligibility for this program will be conducted at their respective correctional institutions, prior to their acceptance at this facility.

**Commissary**  Adequate storage space should be provided to maintain sufficient inventory between deliveries.

**Laundry**  A central full-service laundry unit will be provided. Clothing, linen, and bedding will be distributed and collected at each Housing Unit.

**Central Supply/Warehouse/Storage**  Central Supply will serve as the storage warehouse and distribution point for the facility. With the exception of food, medical and commissary items, all institutional items, such as office supplies, paper products, furniture, janitorial supplies and resident clothing, will be
stored here and distributed to the rest of the facility.

Additionally, sufficient storage will be required for food service, dry goods, commissary, general supplies, uniforms and equipment

**Maintenance/Central Heating Plant**  The maintenance facility will contain office space, parts storage, toilet facilities and storage areas. Maintenance will be responsible for the upkeep of the facility, providing shops for plumbing, electrical, carpentry and painting.

**Central Heating Plant**  Mechanical rooms will be provided throughout the facility. Air-conditioning will be required in most staff occupied spaces and in some select resident use areas.
The USS Lexington is a vintage W.W.II aircraft carrier. She was commissioned in 1943, and originally named USS Cabot, but when the USS Lexington (CV-2) went down on August 5, 1942, in the Battle of the Coral Sea, in honor of that vessel, her name was changed to Lexington. After serving in W.W.II she became on 29 December 1962, the Navy’s training aircraft carrier (CVT) making trips from Pensacola Fla., to the Gulf of Mexico. The USS Lexington was decommissioned on 26 November 1991 and now serves as a carrier museum in Corpus Christi, Texas, her permanent home.

The vessel has a total of 10 decks: 7 full decks and 3 platforms. For this project we will be concerned only with those decks above and including Deck 4: Below this deck are located water and fuel tanks as well as boiler and engine rooms, and utilizing these decks would only complicate matters.

Structurally, the 4th and Main (Hangar) Decks are strength decks, that is, they are a part of the ship’s box girder -- despite the fact that the forward elevator pit cuts through the Main Deck disrupting its structural continuity. The Flight Deck, was not built as an integral part of the hull (tell-tale are the three expansion joints. at Frames 63, 111 and 148), and was armoured when she was briefly decommissioned in 1954. 2nd, 3rd and Gallery Decks are neither armoured nor
The program for the felony substance abuse treatment facility requires large areas for resident housing, education and administration, the other support services (visiting, food service, etc.,) requiring programmatically much less space.

Administration as well as Psychiatric Services are located on the Gallery Deck and at the forward end of the Hangar Deck, in both cases utilizing the existing partitions.

Housing requires an area that is clearly defined and containable (if necessary) and therefore is located on the three decks below the Hangar Deck. The first thing that is done, therefore, is to "clean house" and remove all non-structural partitions from these decks, leaving only the strength bulkheads. Additionally, all existing vertical circulation (ladders and staircases) were removed. The layout of Housing is then based on the practice adopted in traditional detention facilities where cell blocks are arranged as two (or more) floors of cells wrapped around a central dayroom: The residents' rooms are laid out on either side of the ship's transverse bulkheads, while parts of decks 2 and 3 are removed creating three-story high dayrooms. ¹ Each deck has a central corridor, running lengthwise, and each dayroom has one or two circular stairs (depending on its size)

¹ Natural light may be brought into the dayrooms by cutting holes in the side plating of the vessel between the horizontal and vertical frames.

² This draws on the program implemented at Simon Fraser University in British Columbia. For more on the subject please refer to Marcia Chaiken, "In-Prison Programs for Drug-Involved Offenders," National Institute of Justice, Issues and Practices, Washington, D.C., July 1989.
accessing its upper levels. Firestairs at Frames 39, 184 and at the ship's mid-section, provide egress to the Flight Deck.

This is a facility where the moral development of the residents is (hopefully) accomplished through their education, and where behavior that is considered by lawabiding society to be injurious to others, is corrected.

An Education Building, threfore, has been created -- symbolically separate in its architectural language and form, yet still a part of the ship. Where to situate it, however, becomes problematic: to set it on the Flight Deck — an obvious choice — might imbalance the ship, due to the concentration of loads on only part of the deck. However, if part of the vessel could be cut away, the building would then, fulfilling a basic law of naval architecture, "make good the material lost." The part of the vessel that is chosen to be (partially) removed to accommodate this Education Building, is the angled flight deck which was added to the Lexington to enable simultaneous launching and recovery operations of aircraft. This angled flight deck extends on the portside beyond the 'natural' line of the vessel and is supported beneath by "blisters" originating at the Hangar Deck. Since the structure above Main is not an integral part of the ship's girder, removing part of it would not damage the ship structurally, especially if the weight of the materials removed were to be put back or 'made good.' (Otherwise the ship would show a starboard list.) The part of the angled deck that is removed lies between the middle of the three expansion joints and the Gallery level port side gun sponson at Fr. 184. The structure of the vessel abaft of this sponson needs

3 Before 1953 U.S. carrier flight decks were zoned, with a landing area aft and a parking and rearming area forward. Typically the entire air group would be parked aft for mass takeoff, the size of the air group limited by the deck length required for aircraft to roll. An angled (landing) deck is an attempt to get around this problem by separating the landing area from the parking and takeoff zones. (Friedman, p.2)
to be left intact; to do otherwise would seriously jeopardize the ship's stability.

The Education Building 'sits,' or 'rests' on the Main Deck, which, if necessary, could be strengthened by longitudinal and transverse girders worked under the deck. The building is a space-frame, constructed of three-story tall Virendeel trusses. Its outline follows that of the removed angled flight deck and the port side facade of the space-frame is placed at an angle, in 'memory' of the structure that once supported the angled deck. The width of each bay was determined by the spacing of the ship's side frames and the angle of the angled flight deck, so that at the port side perimeter of the Main Deck, the weight of the building would be carried by the ship's structural members. The inboard side of the building (the side which 'interfaces' with the carrier) is welded back to the ship, thereby preventing the building — which progressives cantilevers over the port side — from toppling over. Additionally, to reinforce the building's stability, if at least only visually, at roof level, cables tie each canted member of the building's port side facade back to the Flight Deck by way of vertical extensions of the columns of this facade.

The final modification of the carrier is seen in the forward elevator pit: with the elevator permanently raised, the elevator pit is converted into an auditorium/theater.

All decks forward of Fr. 39 and aft of Fr. 184 are left in their present condition, (except for level 01, which is extended aft up to Fr. 184 to accommodate the second level of Medical.) Forward of Fr. 39 each level of Housing has a visiting area, while aft of Fr. 184 on these same decks are located Security and Disciplinary Offices, as well as Counseling spaces.

The vehicular sallyport is located behind the hangar doors of the starboard deck-edge elevator.
Visitors and staff enter at the existing starboard Quarterdeck entrance.

The two levels of Food Service are located beneath the "island" on the starboard side of Main and 01 Levels.

Finally, Uptakes and Intakes, located on the starboard side of the vessel, are converted and serve as the facility's mechanical rooms.
Glossary

Aft. Toward, at, or near the stern.
Bilge. Intersection of bottom and side. May be molded or angular as in a chine form hull.
Bilge strake. Course of shell plates at the bilge.
Bow. The forward end of a ship.
Bracket. A plate used to connect rigidly two or more structural parts, such as deck beam to frame, or bulkhead stiffener to the deck or tank top (usually triangular in shape).
Bridge, navigating. The conning station or command post of a ship.
Bulkhead. A term applied to the vertical partition walls which subdivide the interior of the ship into compartments or rooms. The various types of bulkheads are distinguished by their location, use, kind of material or method of fabrication, such as forepeak, longitudinal, transverse, watertight, wire mesh, pilaster, etc. Bulkheads which contribute to the strength of a vessel are called strength bulkheads, those which are essential to the watertight subdivision are watertight or airtight bulkheads, and gastight bulkheads serve to prevent the passage of gas or fumes.
Butt. The end joint between two plates or other members which meet end to end.
Deck. A platform in a ship corresponding to a floor in a building. It is the plating, planking, or covering of any tier of beams either in the hull or superstructure of a ship.
Deck, platform. A lower deck, usually in the cargo spaces, which does not contribute to the longitudinal strength of the ship.
Deck stringer. The strake of plating that runs along the outboard edge of a deck.
Double bottom. Compartments at the bottom of a ship between inner bottom and the shell plating, used for ballast water, fresh water, fuel oil, etc.
Doubling (doubler) plate. A plate fitted outside or inside of and faying (touching) against another to give extra local strength or stiffness.
Flare. The spreading out of the hull form from the central vertical plane, with
increasing rapidity as it rises from the waterline to the rail; usually in the forebody.

**Flat.** A partial deck, usually without camber or sheer.

**Floor.** Vertical transverse plate immediately above the bottom shell plating, often located at every frame, extending from bilge to bilge.

**Fore.** A term used in indicating portions or that part of a ship at or adjacent to the bow. Also applied to that portion and parts of the ship lying between amidships and the stem; as in forebody, forehold, and foremost.

**Fore-and-aft.** In line with the length of the ship; longitudinal.

**Forecastle.** A partial deck fitted at the extreme forward of the upper deck.

**Forward.** In the direction of the stem.

**Frame.** A term used to designate one of the transverse members that make up the riblike part of the skeleton of a ship. The frames act as stiffeners, holding the outside plating in shape and maintaining the transverse form of the ship.

**Frame spacing.** The fore-and-aft distance, heel to heel, of adjacent transverse frames.

**Girder.** A continuous member running fore-and-aft under a deck for the purpose of supporting the deck beams and deck.

**Hogging.** Straining of the ship that tends to make the bow and stern lower than the middle portion.

**Hull.** The structural body of a ship, including shell plating, framing, decks, bulkheads, etc.

**Hull girder.** That part of the hull structural material effective in the longitudinal strength of the ship as a whole, which may be treated as analogous to a girder.

**Inboard.** Inside the ship; towards the centerline.

**Inner bottom.** Plating forming the top of the double bottom.

**List.** If the centerline plane of a ship is not vertical, as when there is more weight on one side than on the other, she is said to list, or to heel.

**Longitudinals.** Fore-and-aft structural shape or plate members attached to the underside of decks, flats, or to the inner bottom, or on the inboard side of the shell plating, in association with widely spaced transverses, in the longitudinal framing system.

**Pillar.** Vertical member or column giving support to a deck girder, flat or similar structure, also called stanchion.

**Port side.** The left-hand side of a ship when looking forward. Opposite to starboard.

**Sheer strake.** The coarse of shell plating at strength deck level.

**Shell plating.** The plates forming the outer side and bottom skin of the hull.

**Slamming.** Heavy impact resulting from a vessel's bottom forward making sudden contact with the sea surface after having risen on a wave. Similar action results from rapid immersion of the bow in vessels with large flare.
Starboard side. The right-hand side of a ship when looking forward. Opposite to port.

Stiffener. An angle, T-bar, channel, built-up section, etc. used to stiffen plating of a bulkhead, etc.

Lace. A course, or row, of shell, deck, bulkhead, or other plating.

Strength deck. The deck that is designed as the uppermost part of the main hull longitudinal strength girder. The bottom shell plating forms the lowermost part of this girder.

Stringer. A term applied to a fore-and-aft girder running along the side of a ship at the shell and also to the outboard strake of plating on any deck.

Stringer bar. The angle connecting the deck plating to the shell plating or to the inside of the frames.

Stringer plate. (see deck stringer).

Transverse. A deep member supporting longitudinal frames of bottom or side shell or longitudinal deck beams. At right angles to the fore-and-aft centerline.

Uptake. A casing connecting a boiler or gas turbine combustion product outlet with the base of the inner casing of the smokestack.
Chapter 1


Chapter 2


AMITY, "What is Amity Right Turn?" Published by Amity, P.O.Box 32200, Tucson, AZ, 85751-2220


Appendix

**USS Lexington: Deck Plans With Structural Bulkheads**
USS LEXINGTON: 2nd DECK
(Existing Partition Layout)
USS Lexington: Modified Deck Plans
- Level 15 (Plinth) EL. 28' 4"
- 3rd Floor EL. 58' 5/8"
- Level 02 (Gallery) EL. 14' 6"
- 2nd Floor EL. 14' 6"
- 1st Floor EL. 6' 6"
- Level 00 (Hangar) EL. 6' 6"
- Level 2 EL. -6' 5"
- Level 3 EL. -10' 4"
- Level 4 EL. -24' 5"
- Level 5 (First Platform) EL. -30' 7"
- Level 6 (Second Platform) EL. -36' 9"

CROSS SECTION, LOOKING FORWARD
(below HD @ Fl. 1117112, above HD @ Fl. 1427142)
LOAD BEARING HOPPENAL FIBER RATED STEEL SECURITY WALL SYS.

EXISTING LONGITUDINAL 3" STEEL STRUCTURAL BULKHEAD

LOAD BEARING HOPPENAL STEEL SECURITY WALL SYSTEM (NON-RATED)

CATWALK EDGE

GIRDER ABOVE (SEE DETAIL)

CELL WALL CONSTRUCTION (plan)
LEVEL 00 (HANGAR DECK)
3" DECK PLATE (EXISTING)

6" x 2" 1/4" TUBE STL (TYP)

EXIST. TRANSVERSE 3" STL STRUCTURAL BULKHEAD @ FR 42

LEVEL 2
EXIST. 1" DECK PLATE

LOADBEARING (10,000 PLF)
HOPFMAN
6" STEEL SECURITY WALL SYSTEM
(REFER TO PLANS FOR LOCATION OF FIRE RATED WALLS)

LEVEL 3
EXIST. 1" DECK PLATE

LEVEL 4
EXIST. 2" DECK PLATE
CABLE FASTENING @ TOP OF COLUMN
CABLE FASTENING @ TOP OF COLUMN
TS 8x8 (bottom chord of virendeel)

24"

TS 12x12

SUSSET PLATE

6"

1" plate on main deck

TS 12x8 (floor beam)

FLOOR FRAMING (plan)

0 3 6 9 12 in.
LEVEL 03
EL. 20'-4"

FLOOR FRAMING @ 3RD FLOOR & LEVEL 03

12" GIRDERS 6'-0" O.C.
12" JOISTS 18" O.C.

TS 12x12

1" GUSSET PLATES

TS 12x12
3" MAIN DECK (LEVEL 00)

6" GIRDER 16'-0" O.C.

6" ANGLES WELDED TO EXISTING LONGITUDINAL STRUT, BULKHEAD

10" JOISTS 6'-0"

BULKHEAD REPLACEMENT
Doubling Plate

Existing Connection

10" Joist (Exist.) 4' & 8' OC.

16" Girder (Exist.) 8' 0" OC.

2" Steel Pipe Rails - Painted

3 x 15 Bent Plate (as Carling)

Cell Balcony

Scale: 0 3 6 9 12 in. 0 1 2 ft.
This page intentionally left blank