design thesis by k.c. krumwiede : north dakota state university : spring 2006

exploring industrial architecture and creating technological identity



# INDUSTRIAL FORENSICS LABORATORY O north dakota state university research and technology park

a vibrant facility around the clock : night view from northwest



*site plan : 1/64"=1* 

## Systematic processes

The spatial layout of the laboratory metaphorically references an industrial process in that the facility is separated into individually functioning components that work harmoniously to operate the facility at an optimal level. Generally speaking, the layout is broken up into 3 systematic zones, each embodying a specific security level and function.

## context and spatial interpretation OOOOO



main floor plan : 1/16"=1



layered component section : no scale

## material application and assembly OOOOO



### -sarnafil roof membrane with plastic standing seams

- rigid insulation corrugated steel deck

open web steel joist

- metal flashing rheinzink metal panels air infiltration barrier exterior gypsum board sheathing

> 2" concrete topping -8" precast concrete planks

balloon framed steel studs interior gypsum board metal flashing

-wide flange steel girder

- insulated precast concrete panels

batt insulation - in-fill framed steel studs -interior gypsum board

4" concrete slab on grade 4" granular fill

-sealant joint and flashing

continuous concrete footing

## Streamlined industrial application

The exterior material application on the laboratory uses traditional industrialbased materials in a dynamic way that engages observers and occupants. The use of texture, depth, and color provide a compelling envelope that embodies the integrity of a traditional industrial building while creating an improved, streamlined appearance.

### view of south entry

## materials legend

- 1. rheinzink metal panels
- 2. corrugated stainless steel panels
- 3. aluminum light shelf and sun screen
- 4. copper panels
- 5. horizontally tooled precast panels
- 6. pilkington solar-e glass
- 7. low-emissive fritted glass

## O stratified planes and volumes

The holistic composition of the facility visually separates interior function by manipulating volume, height, and material to create a stratified, yet unified composition. The physical vocabulary of the laboratory is an extension of metaphorical relationships established during spatial planning, in that each volume performs a specific role that contributes to the holistic function and beauty of the building.

### north facade and main entrance

## *visual continuity*

The facility's diverse material palette and volumetric variance requires the establishment of visual continuity. The horizontal emphasis placed on each specific material application, and reoccurring colored accents create a consistency and several lines of continuity that subconsciously infer harmonization through variation.

south facade and service entrance



## holistic composition OOOOO





## structural systems : no scale



hvac layout : no scale



## Oexposing technology

The laboratory's structural and hvac systems remain exposed in most spaces to exemplify the technical characteristics conducive of an industrial environment. The exposed structural members are playful and contrive creative interaction with building occupants. The facility features two separate hvac systems in order to safely and sufficiently accommodate both the research and public-based spaces.

## structural character and hvac 00000



character detail b

## view of public corridor from south entrance

## *visual interaction*

The interior character of the facility reveals the underlying components of a functional building. More importantly, it celebrates them. Structure, hvac, and electrical equipment are the technological 'guts' in every building and deserve celebration. The use of playful light, shadows, and finishes complement the exposed systems to create a technical environment, rich in human-scale interactive qualities.

## O design process and refinement

The concept of creating an industrial building whose physical nature expresses high technology required detailed refinement at all levels of design. Sketches and overlays were used to refine vehicles of design and concepts.



## interior character and design process 00000





LINE OF CONTINUTY INDUSTRIAL LAPORATORY

tectonics



creating symbolism





human scale interaction