



Office de la Propriété
Intellectuelle
du Canada

Un organisme
d'Industrie Canada

Canadian
Intellectual Property
Office

An agency of
Industry Canada

CA 2672934 A1 2011/01/22

(21) **2 672 934**

(12) **DEMANDE DE BREVET CANADIEN
CANADIAN PATENT APPLICATION**

(13) **A1**

(22) Date de dépôt/Filing Date: 2009/07/22

(41) Mise à la disp. pub./Open to Public Insp.: 2011/01/22

(51) Cl.Int./Int.Cl. *B60S 3/04* (2006.01),
B08B 3/08 (2006.01)

(71) Demandeur/Applicant:
SURPRENANT, MAXIME, CA

(72) Inventeur/Inventor:
SUPROVICI, JONATHAN, CA

(54) Titre : INSTALLATION DE LAVAGE PORTATIVE A BOUCLE DE RECYCLAGE

(54) Title: PORTABLE RECYCLING WASHING FACILITY



PORTABLE RECYCLING WASHING FACILITY

Description

BACKGROUND OF THE INVENTION

Field

The invention is in the field of washing systems and method used in washing objects such as vehicles and equipment where the washing fluid, generally water, must be efficiently managed.

State of the Art

In the field of washing vehicles and equipment, often is the case where one must use a washing fluid, generally water, which washes away contaminants off the vehicles and equipment. In such cases, the fluid then contains a certain amount of various contaminants such as hydrocarbons, dirt and salts. Often, other contaminants are added to the washing fluid in the washing process such as soaps, detergents and waxes. The resulting waste fluid and the contaminants it contains are becoming a growing concern to manage as environmental awareness and regulations are imposing themselves.

In the past, conventional wide spread washing systems generally consist of a constructed permanent structure in which automated or manual washing equipment is used during the wash. These permanent facilities have the disadvantage of having a high cost. Adding recycling systems to these facilities generally requires excavation and construction, further increasing their costs. Additional high real-estate and operating permit costs are incurred by these types of structures.

Wash water filtering systems are widely known in the art. They generally include many water treatment stages and equipment such as a settling tank, a separation chamber, a media filter (bag filter, sand filter, cartridge filter, etc...), chemical treatment and biological treatment. Most of these systems have the disadvantage of being expensive, being large in size and requiring excavation.

Portable washing pads are also known in the art. They usually take the form of a sloped surface on which the wash fluid is collected and directed to one of the sides of the pad. These pads have the disadvantage of requiring a certain minimum height equal to at least the total height required to contain a minimal slope along the length of the pad. These heights prevent

these pads from being installed in locations where a minimal clearance is required for operation, such as underground parking lots. Furthermore, these higher pads, generally made from steel, require more material, are heavier and more costly to produce and transport.

Other portable washing pads known in the art consist of a rigid or non rigid container in which the vehicle or equipment is placed during the wash. These pads have the disadvantage of bathing in the washing liquid, producing a wash of lesser quality and convenience because of the splashing and the nature of the contaminants collected. Furthermore, non rigid pads generally have a lower mechanical resistance than their rigid counterpart making them less durable and reliable.

Conventional washing methods are also known in the art. The conventional method of washing for many of these washing facilities consists of the use of high pressure high flow wash as well as multiple phases of washing including an initial rinse, the application of cleaning product, a final rinse and drying. In some cases more rinses are used between intermediate stages of cleaning product applications. This washing method has the disadvantage of wasting more water through greater water usage, waste, evaporation and splash losses.

SUMMARY OF THE INVENTION

A main aspect of the present invention is a unique complete portable washing system included in a single compact structure. The system is comprised of a water reclaiming pad, enclosed by side panels, mounting ramps, enclosed storage area and a rain water collecting roof. The system is further comprised of a water recycling system, a pressure washing system and an electronic control system. This system has the overall advantage of being a one product solution to car washing in minimal spaces at minimal cost within a short installation time and providing a complete water recycling solution.

The reclaiming pad is composed of one or more water reclaiming platform units connected together to produce a desired total wash area on which the vehicle or equipment is placed during the washing process. This single water reclaiming platform unit is composed of a rectangular raised rigid frame. The bottom of the platform comprises of a rigid sheet of material, sloping from two opposite sides towards a depressed gutter at the middle line of the platform. This gutter is covered by a fine filtering grating. The bottom of this gutter is sloped perpendicularly to the previous slope from the sides toward the center point of the platform,

where a drain is located on the sidewall of the gutter. The platform's top surface is comprised of a thick rigid grating supporting the vehicle or equipment and through which the wash fluid can flow to be collected in the platform. This invention allows a lower profile water reclaiming pad, enabling its installation in low clearance areas, such as interior parking space. It also requires less material and produces a lesser total weight and cost.

The side panels are comprised of thin rigid material connected directly on the sides of the reclaiming pad reinforced by intermediate vertical support beams. The panels act to contain any wash fluid from escaping collection via the water reclaiming pad.

The enclosed storage area is either located at the four corner of the pad as columns or along one side of the pad. This storage area act as structural support for the system as well as provide inner storage space for the water filtering system, the electronic control system and several other washing apparatus.

The mounting ramps are connected to each end of the water reclaiming pad permitting vehicles to enter and exit the system, on and off the pad. Additionally, the ramps can be lifted up, fully enclosing the structure when the system is not in operation.

The top of the structure is covered by a rain water collecting roof. The roof encloses the structure to protect and contain the washing activities. The roof also acts as a rain water collection system, supplying the washing system with rain water when additional water is required and rain water has been collected.

The invention also has an incorporated water recycling system integrated in integrated storage area. The water recycling system comprises the following steps and equipment. The water reclaim pad collects the used wash water and directs it to a drain. The water reclaiming pad also acts as a separation basin where the heavier than water contaminants are separated, dried and removed. An oil skimmer can also be placed to remove any lighter than water hydrocarbon. The drained water is pumped by a transfer pump from the water reclaiming pad through the filtering system. The filtering system is comprised of multiple filtering stages including a bag filter, cartridge filter, and oil coalescing chamber and a softening system. The filtered water is then reintroduced into the fresh wash water tank for reuse through the pressure washing system.

New fresh water will have to be periodically supplied to the fresh water tank following water loss due to evaporation and marginal operational losses. This fresh water is supplied from rainwater collected in the roof. Alternately, fresh water is also supplied on demand from the local

supply. Before introduction in the fresh water tank and depending on the quality of the water supply, this fresh water supply is treated through a softening system incorporated in the structure. This recycling system as the advantage of wasting no water in the washing process and does so in a compact manner, within a complete compact washing structure.

A pressure wash system is integrated in the system. An automatic pressure washing unit is integrated in the storage area of the structure and pumps water from the fresh water tank on demand. A hose and diffuser connected to the pressure washer is used to spray water on the vehicle or equipment during the washing process.

The invention is also comprised of an electronic control system. This electronic control system monitors the water levels in the water reclaiming pad and the fresh water tank and controls the transfer pump, pressure pumps and supply valves accordingly. The electronic control system can also control the lighting, the filtering system life cycles and other operational events, such as traffic monitoring and data acquisition.

A second aspect of the present invention comprises a washing method that reduces the amount of water require during the washing process. This hand washing method comprises only an initial low flow rinsing phase, a cleaning agent application phase and a final dry wipe phase. The use of special no rinse cleaning agent combined with a minimal water initial rinsing phase provides a very water efficient car washing method.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

The present invention is a complete portable recycling washing facility integrated in a single compact structure. The structural components of this facility comprises of a water reclaiming pad, enclosed by side panels, mounting ramps, four corner storage columns and a rain water collecting roof. This facility is further comprised of an integrated water recycling system, a pressure washing system and an electronic control system. The preferred embodiment of the present invention is illustrated in the drawing section of this document.

Structure

The water reclaiming pad is comprised of 3 water reclaiming platform units bolted together to produce a total pad area of 16 feet wide by 21 feet long. Each water reclaiming platform unit is a raised frame measuring 16 feet wide by 7 feet long by 4 ¾ inches high. The frame on a unit is comprised of four stainless steel C beams on all four sides with the concave side of the beam facing the exterior of the frame. The frame is reinforced by 16 feet internal stainless steel support beams spaced apart by 2 feet 2 inches. The bottom of the platform is a stainless steel sheet sloped from the two opposite 7 feet sides towards the center, directing the wash fluid towards a central 9 inches wide gutter. The gutter is sloped from each 16 feet side towards the center of the unit where the 1 inch drain is located on the sidewall of the gutter. The length of the gutter is covered by a 5/32 inch perforation grating, preventing large wash residue from entering the gutter. The horizontal support beams are perforated in the gutter to allow the wash fluid to flow from every section to the central drain of the platform.

The top of the reclaiming platform is comprised of two 2 feet stainless steel tracks, 7 feet long and 1 ¼ inches thick. These two tracks are spaced apart by 3 feet and support the vehicle's weight from the wheel base. The rest of the top area is covered by fiberglass grating. Fiberglass beams are fixed along the 7 feet sides on which the side panels are mounted.

The side panels are made of 4mm thick clear thermoplastic sheets supported by vertical fiberglass support beams spaced apart by 3 feet 6 inches. The side panels are connected to the water reclaiming platform and the rain water reclaiming roof.

The four storage columns are located at each of the four corners of the water reclaiming pad. Each column provides an internal storage area of 2 feet wide by 4 feet long by 6 feet high. Each column is enclosed by 4 mm thick aluminum composite sheets and reinforced by vertical support beams. As well as provide structural support for the system, the columns enclose the filtering system, the pressure wash system, the electronic control system and various equipments.

The rain water reclaiming roof covers the whole structure. It is made from light rigid material and shaped in a semi-circular or sloped fashion as to direct rain water to side gutters. The gutters direct rain water to storage containers located under the roof, above each column. The stored rain water can be used to supply the fresh wash water tank when needed.

The mounting ramps are located at each end of the water reclaiming pad. They are made from a combination of stainless steel and fiberglass. They allow vehicles to enter and exit the washing facility on and off the raised water reclaiming pad. The mounting ramps also act as

doors. They can be pivoted upwards and locked into position to enclose the facility when not in operation.

The water recycling system

The water reclaiming pad first collects the used wash water. Large residue is filtered by a 5/32 inches perforation grate placed over the central gutter. Since a small amount of water is used, a long enough period of time will pass before the water reclaiming pad needs to be drained. Hence the water reclaiming pad is also used as a settling tank. Lighter than water contaminants will be allowed to separate to the surface and will be removed by an oil skimmer. Heavier than water contaminants will be allowed to separate to the bottom of the pad and will be mechanically removed periodically.

When the water level inside the water reclaiming pad reaches a high point water level sensor, the transfer pump activates and pumps the water out the water reclaiming pad to the filtering system. The transfer pump deactivates when the low point water level sensor is reached above the drain. Since three water reclaiming platforms are used in the preferred embodiment, the three drains are connected together through piping directed to the transfer pump. These connections also allow water level equilibrium between the three platforms.

The transfer pump required is a stainless steel electrical transfer pump capable of a 20 gpm flow and an output pressure sufficient to pass through the filtering system. The filtering system comprises a 10 micron 20 inches bag filter followed by a 10 micron 20 inches carbon-briquette cartridges filter. A 30000 grains water softening system is also provided in the system to be used if the water quality deems it necessary.

The filtered water is then redirected back to the fresh wash water storage tank, a 105 gallons polyethylene container. Water enters this tank from the filtering system, from the rain water storage tanks and from the local water supply. Water is pumped out of this tank on demand through the pressure washing system. The water level in the tank is controlled by an ultrasonic water level sensor. Following washing activities, when a low point water level is reached inside the fresh wash water tank, it is refilled by filtered water from the water reclaiming pad until the water reclaiming pads' low water level point is reached. If fresh wash water tank high point water level is not, new water is supplied from the rain water storage tanks until the high point water level is reached in the fresh wash water tank or until the rain water storage tanks are empty. If the high point water level is not reached in the fresh wash water tank, water is supplied from the local

water supply until the high point water level is reached. Water loss is expected in the system through evaporation and marginal operational losses.

The pressure washing system pumps wash water from the fresh wash water tank and sprays it through a hose and diffuser on the vehicle during the washing process. This is done manually and on demand of the operator. The pressure washer required is a 30 second automatic pressure pump allowing a pressure regulation of 200 psi to 1500 psi at a flow of 2 gmp.

A central wet-dry vacuum system is also enclosed in the storage area of the facility.

An electronic control system is comprised of an electronic controller and electrical board. The water level sensors located in the water reclaiming pad and in the fresh wash water tank are connected to the controller and monitored by it. The controller operates accordingly the transfer pump, the pressure pump and solenoid valves allowing fresh water supply. The control system also monitors the filters life cycles through pressure sensors. When a specified pressure differential is measured in the filters, the controller alerts the operator that maintenance is required. Other aspects of the washing facility can also be monitored and controlled by the controller, such as traffic volume, washing product quantities, the lighting system, security, etc...

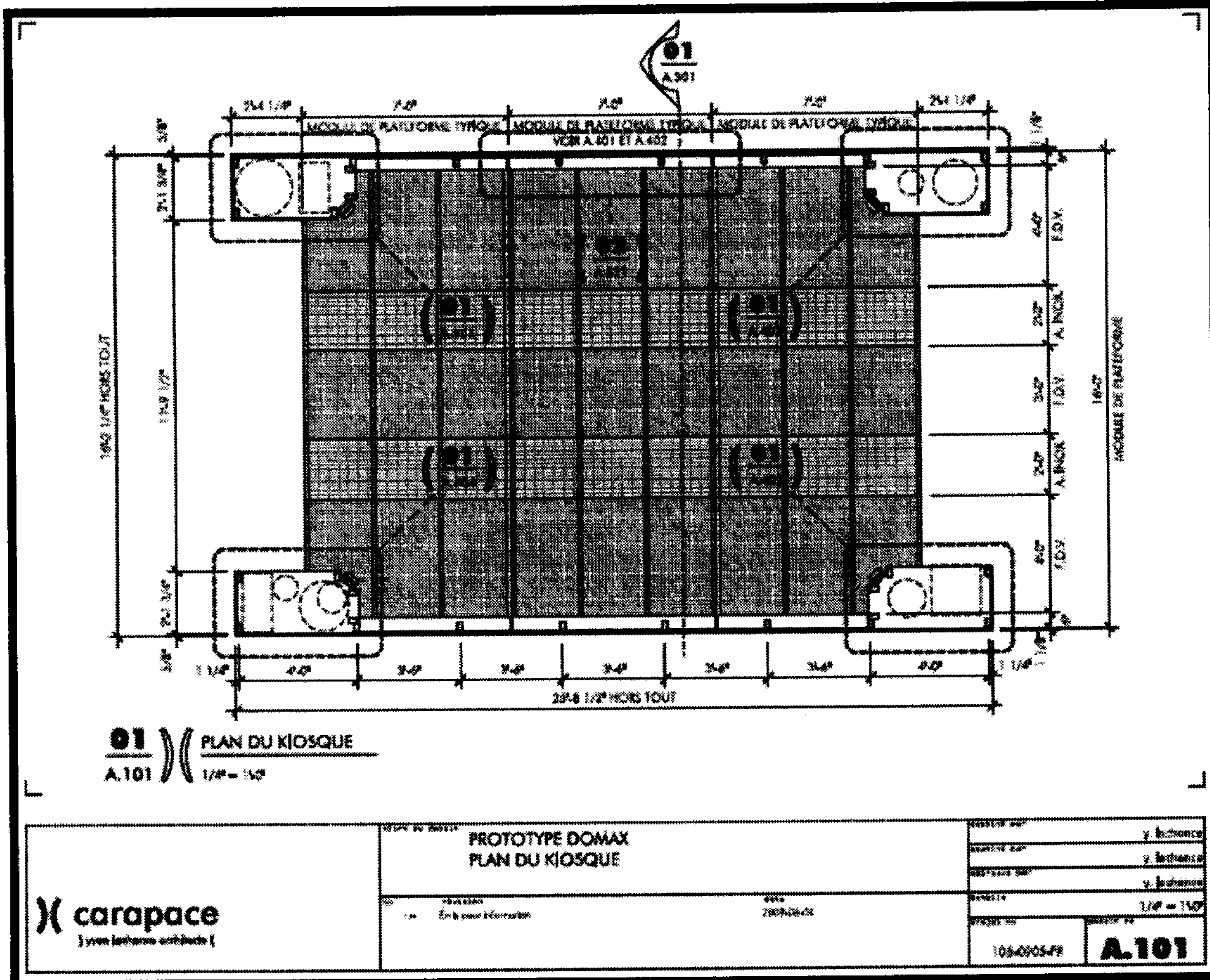
All of these components are seamlessly integrated in a unique compact structure. This alone allows many technical advantages over conventional systems, including reduction in costs, reduction in space requirement and easy access to green technology.

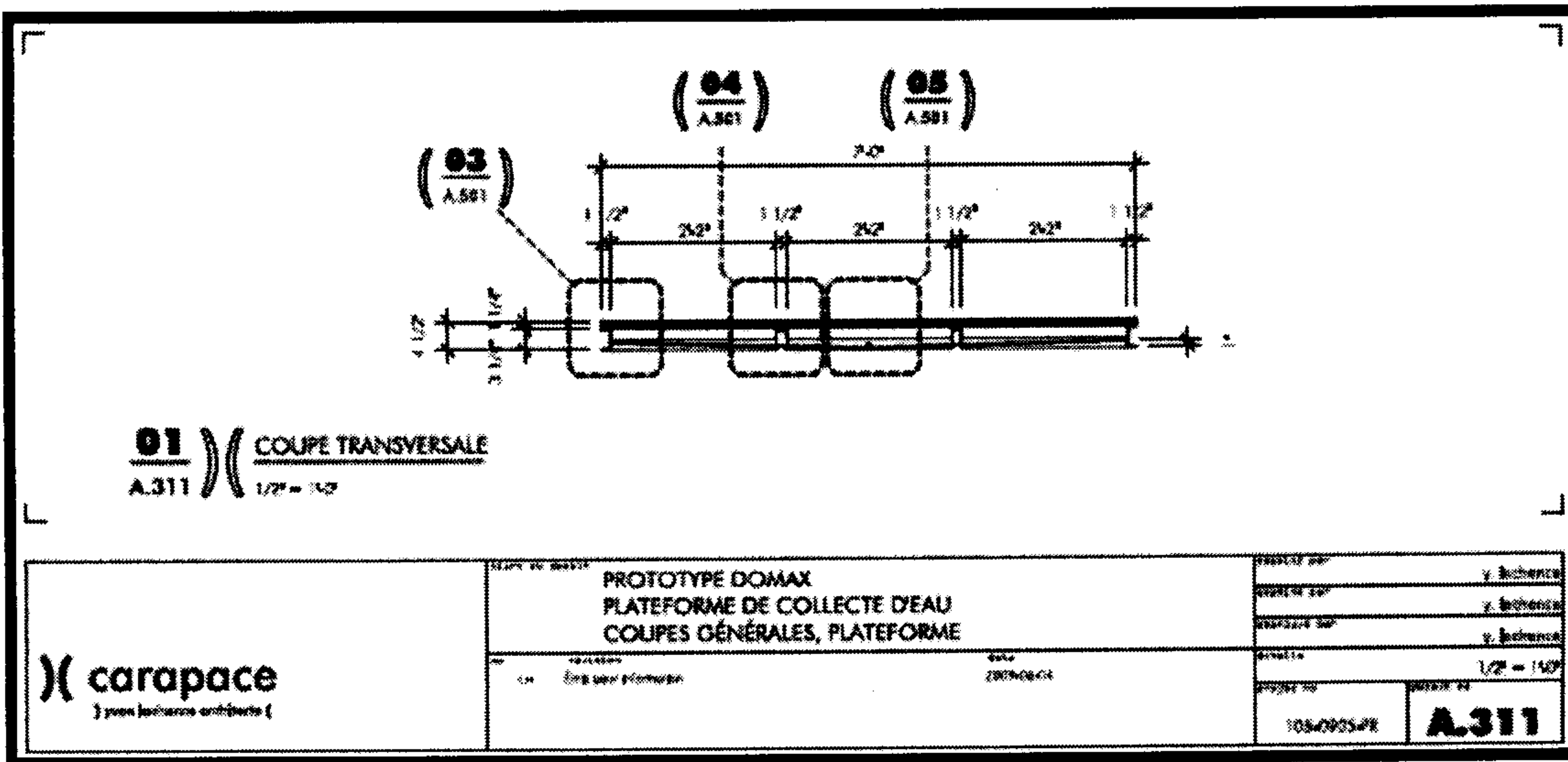
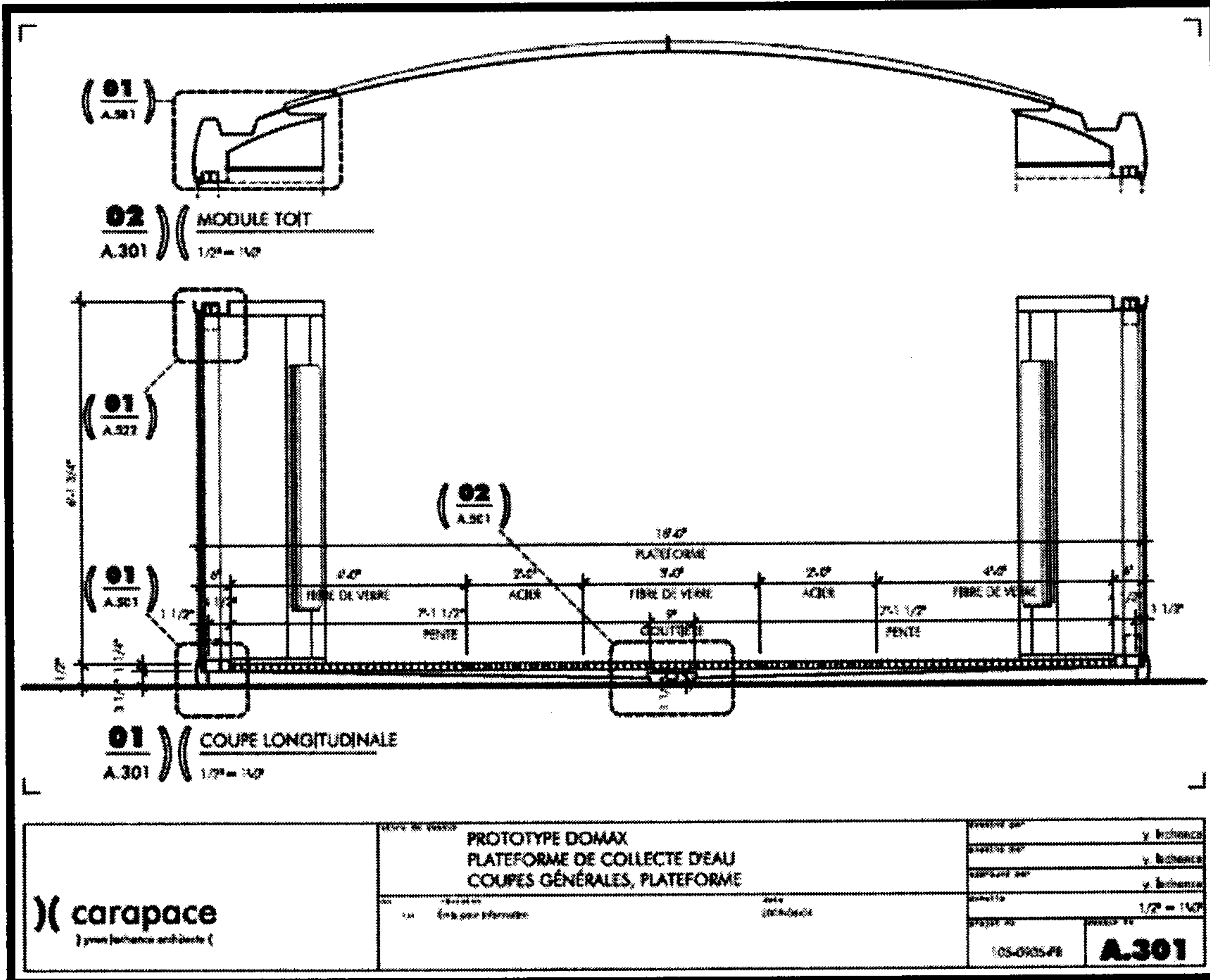
A second aspect of the present invention comprises of a washing method that reduces the amount of water require during the washing process. This hand washing method comprises only an initial low flow rinsing phase, a cleaning agent application phase and a final dry wipe phase. During the low flow rinsing phase, the operator uses the low pressure low flow washing system to spray water to a specific are of the vehicle to wash. Using only 2 gpm at 600 psi and focusing it on one specific area, water is not wasted through splashing or on areas of the vehicle that requires less cleaning. The cleaning agent application phase consists in the spray application of a special cleaning agent, focusing on specific areas of the vehicle. The cleaning agent is applied evenly, area by area. This special cleaning agent does not require that it be rinsed off. The last final dry wipe phase consist in wiping the cleaning agent and water off the vehicle with micro

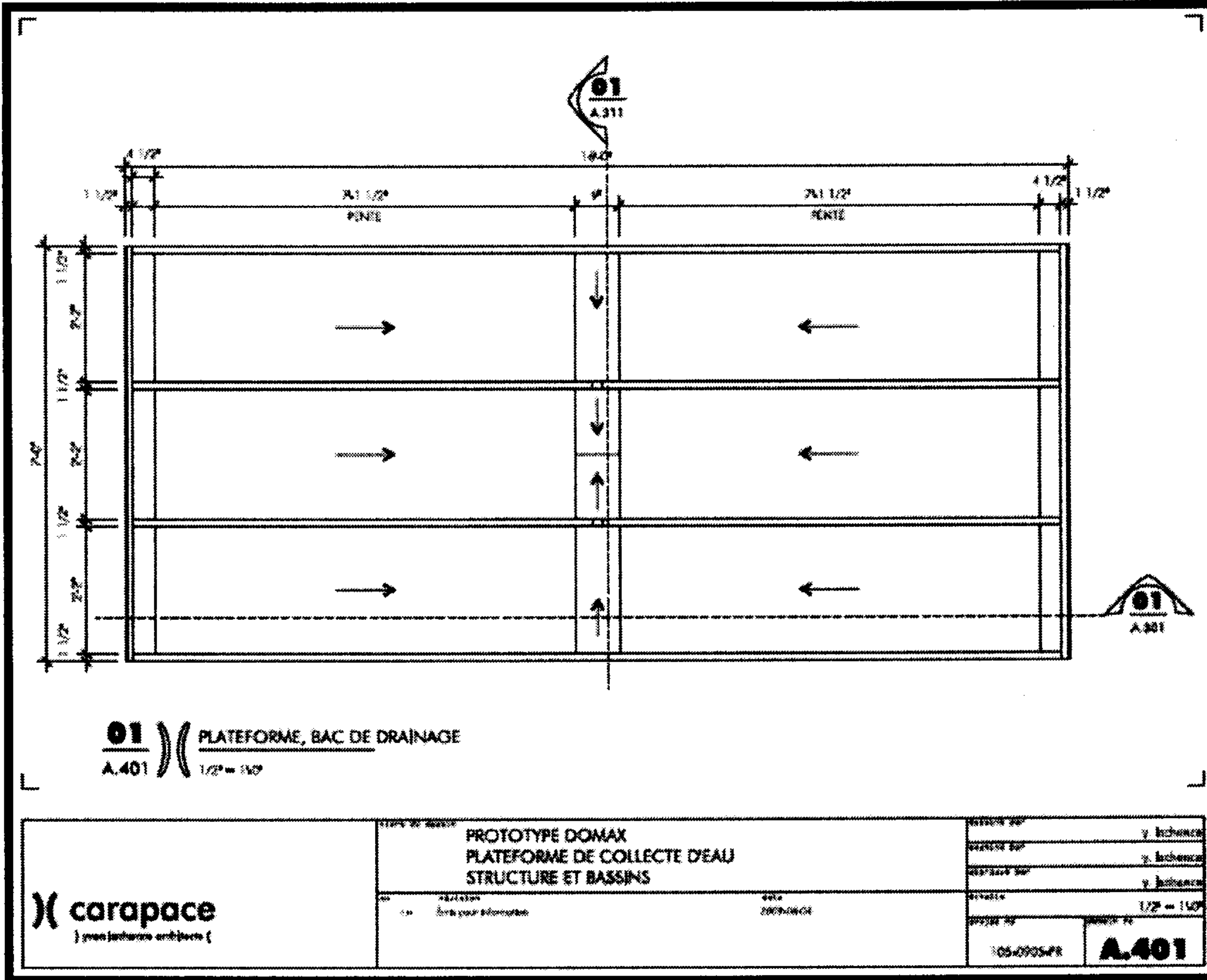
fibers until the vehicle is dried and clean. No other water is used in the method. This method thus provides a high quality hand wash while using minimal water.

The above description is considered that of the preferred embodiment only. Modifications of the invention will occur to those skilled in the art and to those who make or use the invention. Therefore, it is understood that the embodiment shown in the drawings and described above is merely for illustrative purposes and not intended to limit the scope of the invention, which is defined by the following claims as interpreted according to the principles of patent law, including the doctrine of equivalents.

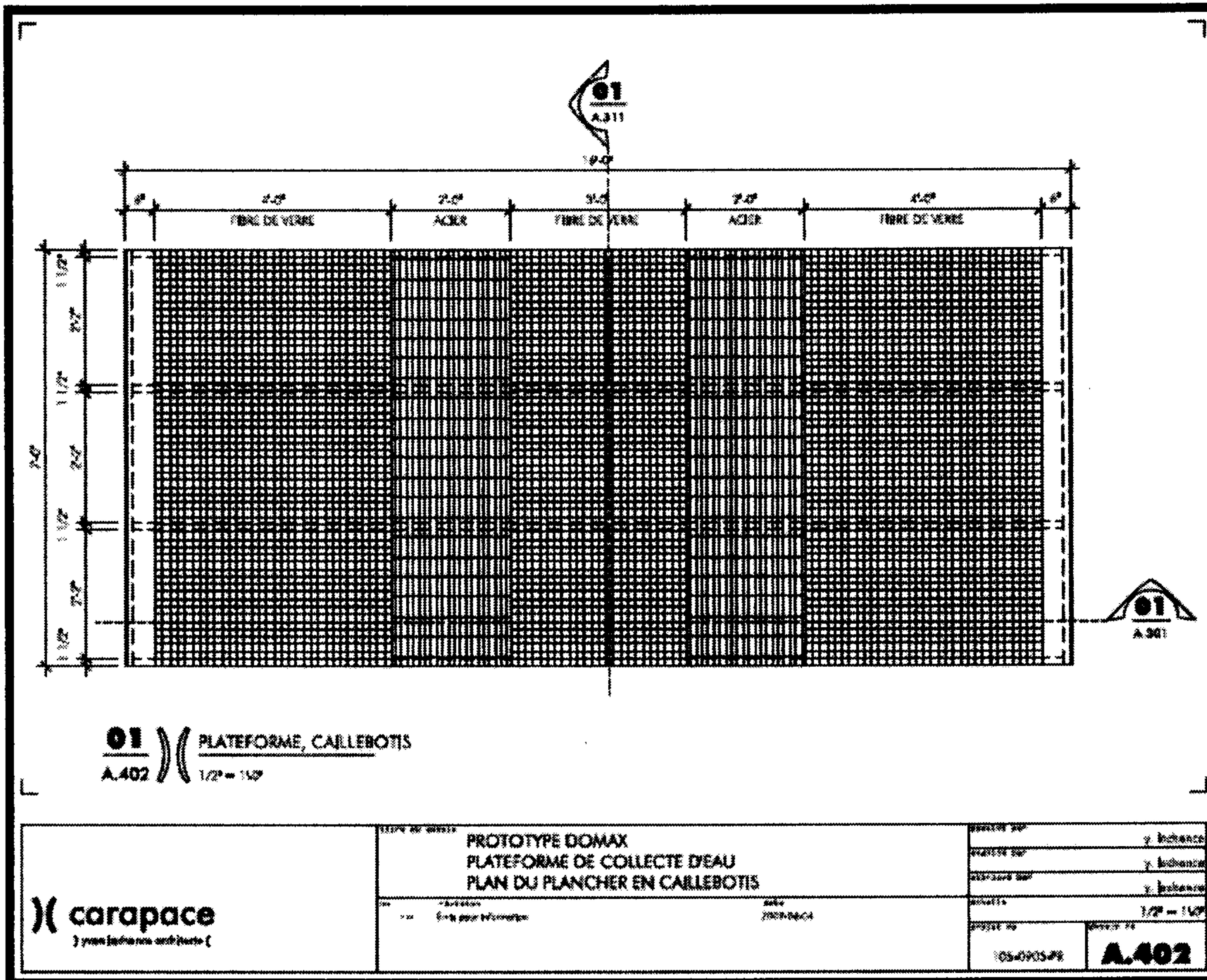
DRAWINGS: Structure

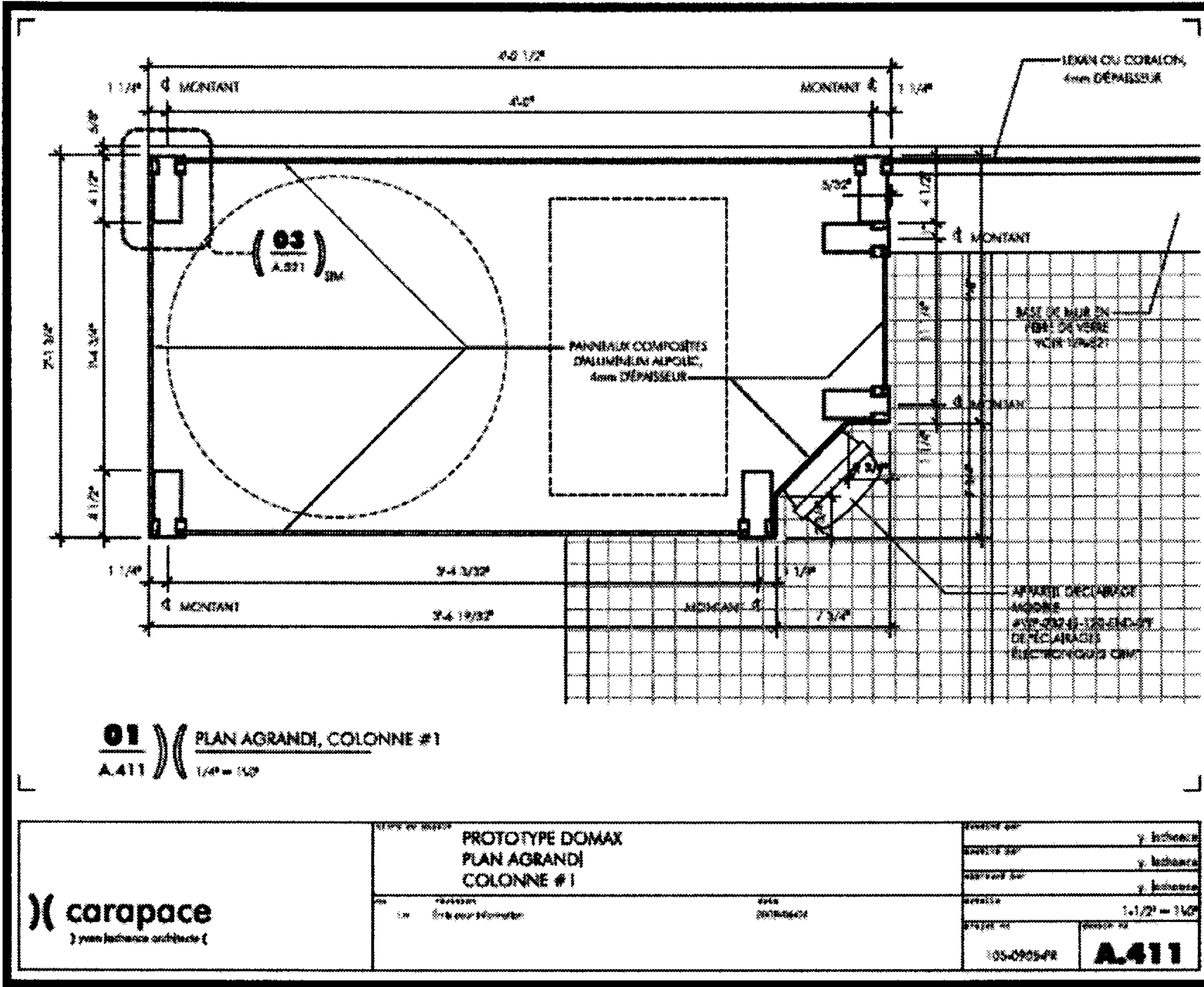


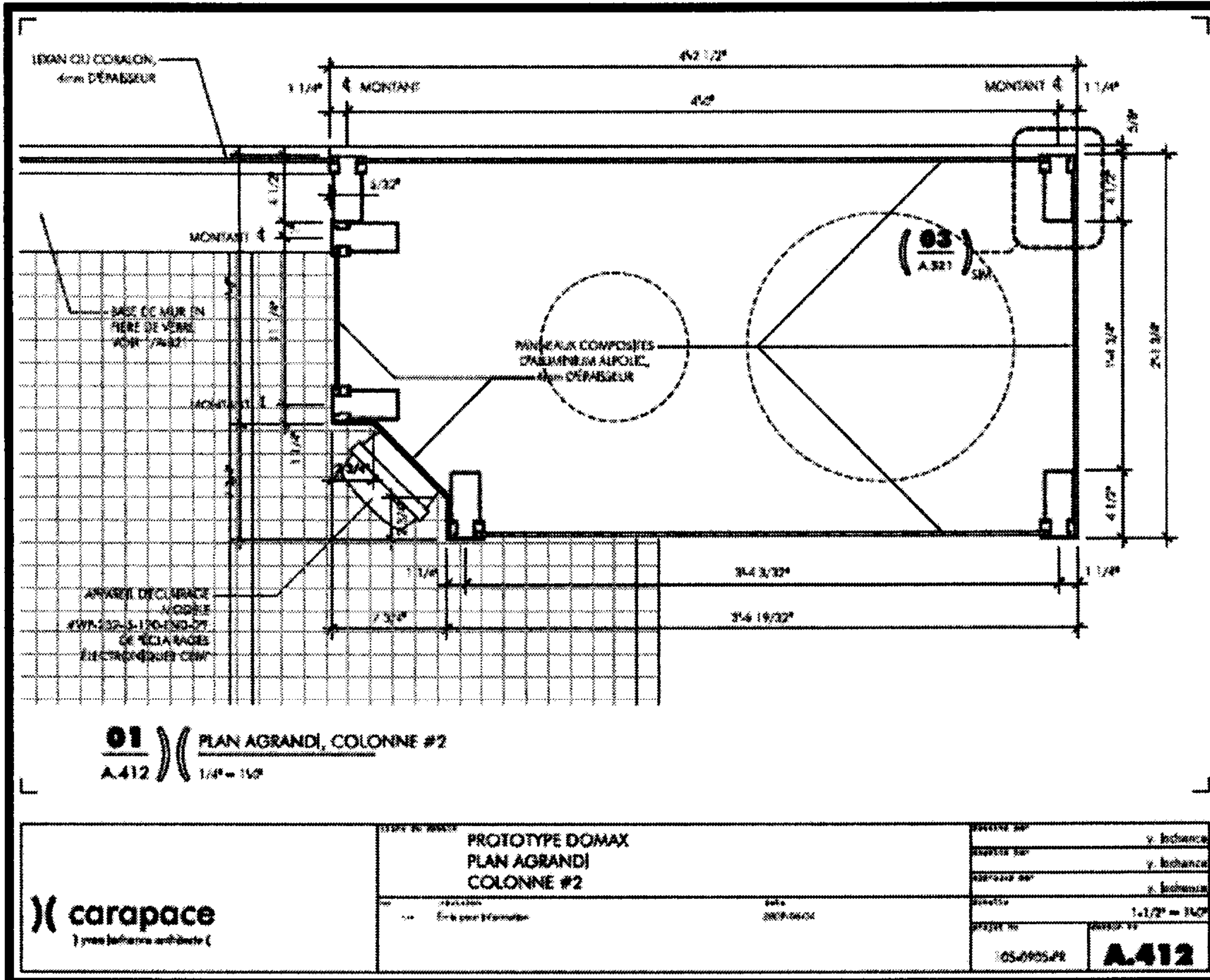


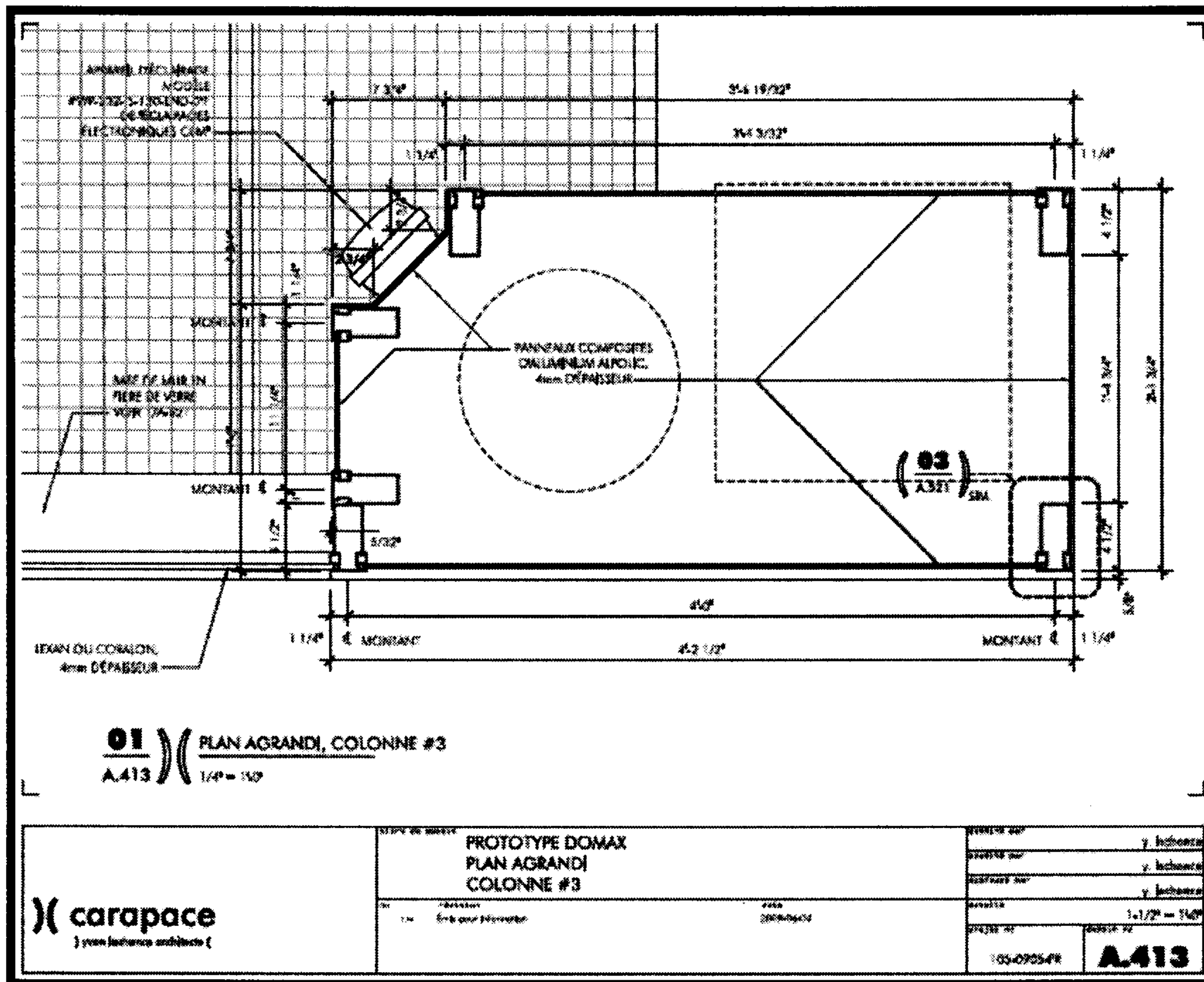


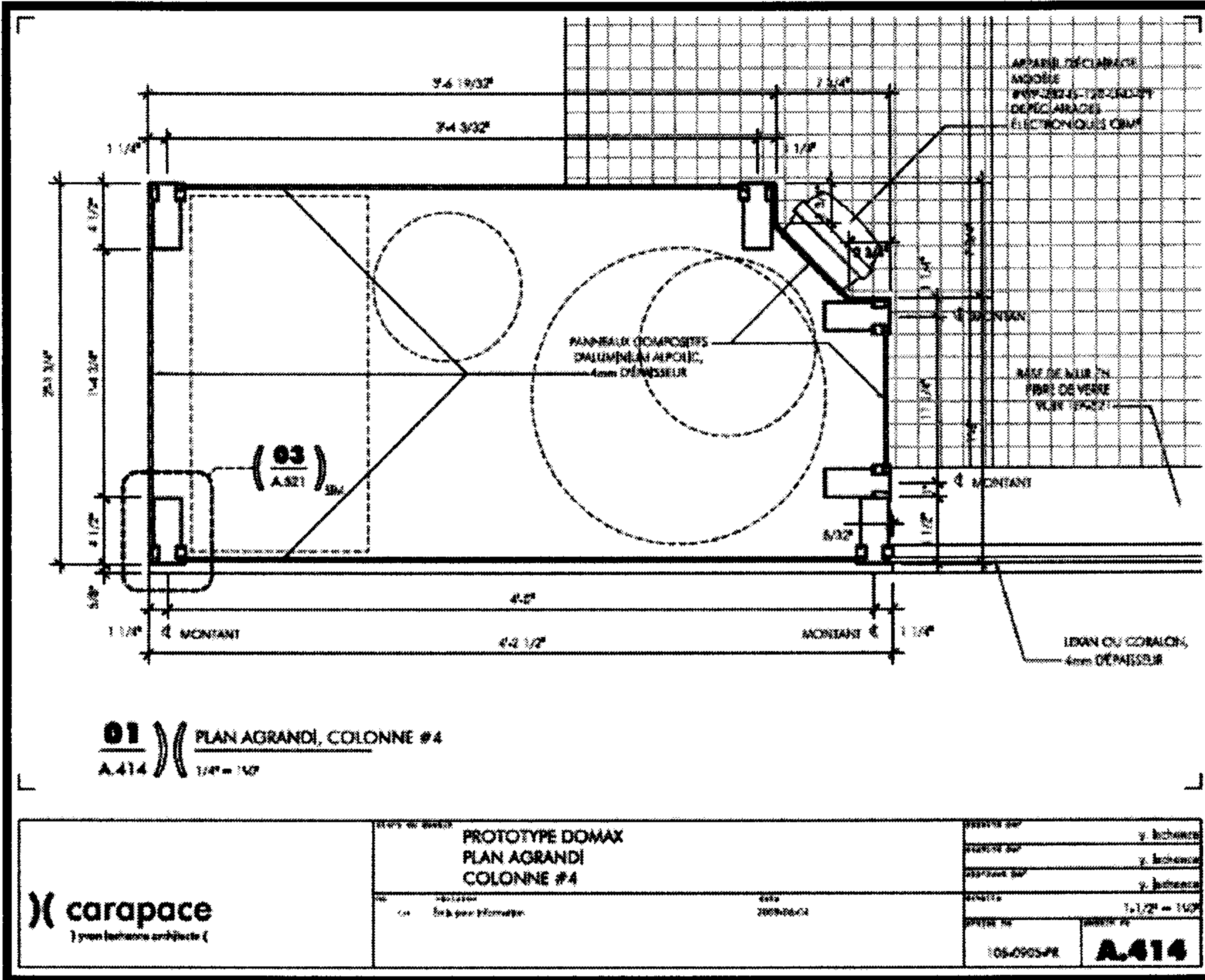
<p>carapace) pour architectes architectes (</p>	<p>PROTOTYPE DOMAX PLATEFORME DE COLLECTE D'EAU STRUCTURE ET BASSINS</p>	<p>PROJETEUR y. bouchon</p>
	<p>DATE 2009-06-04</p>	<p>PROJETEUR y. bouchon</p>
<p>PROJETEUR 1/2" = 1M</p>	<p>PROJETEUR 105-0903-PR</p>	<p>PROJETEUR A.401</p>

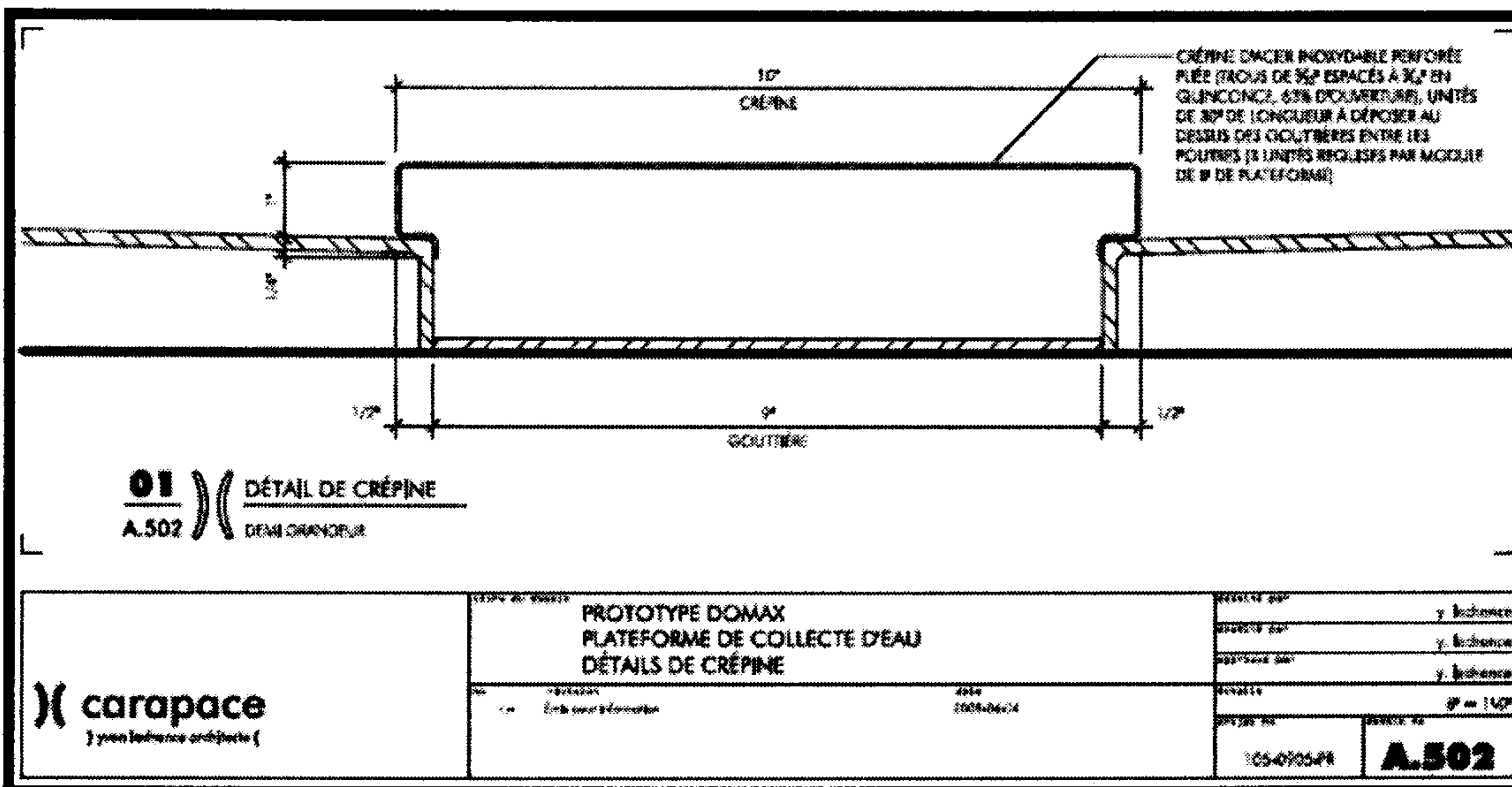
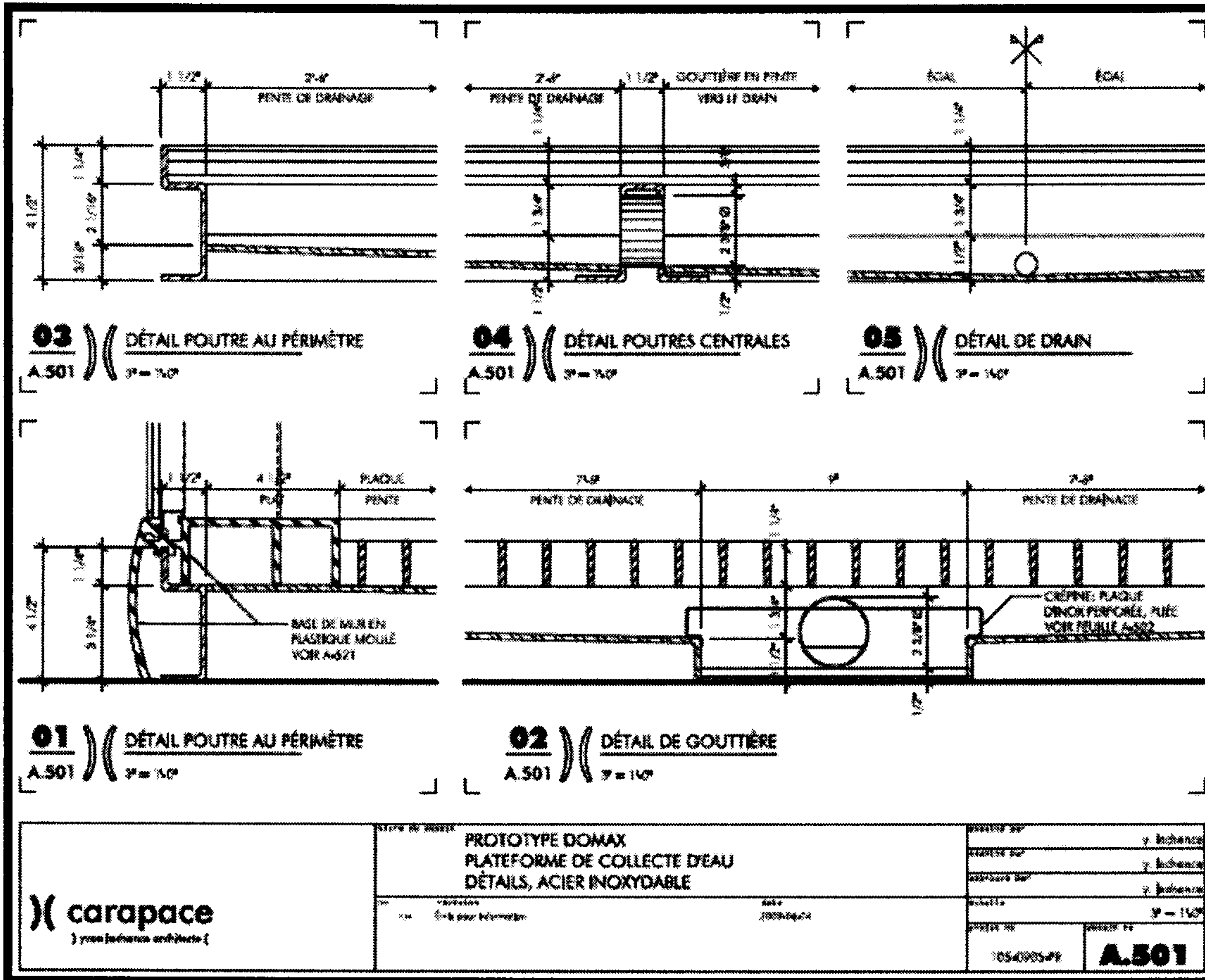


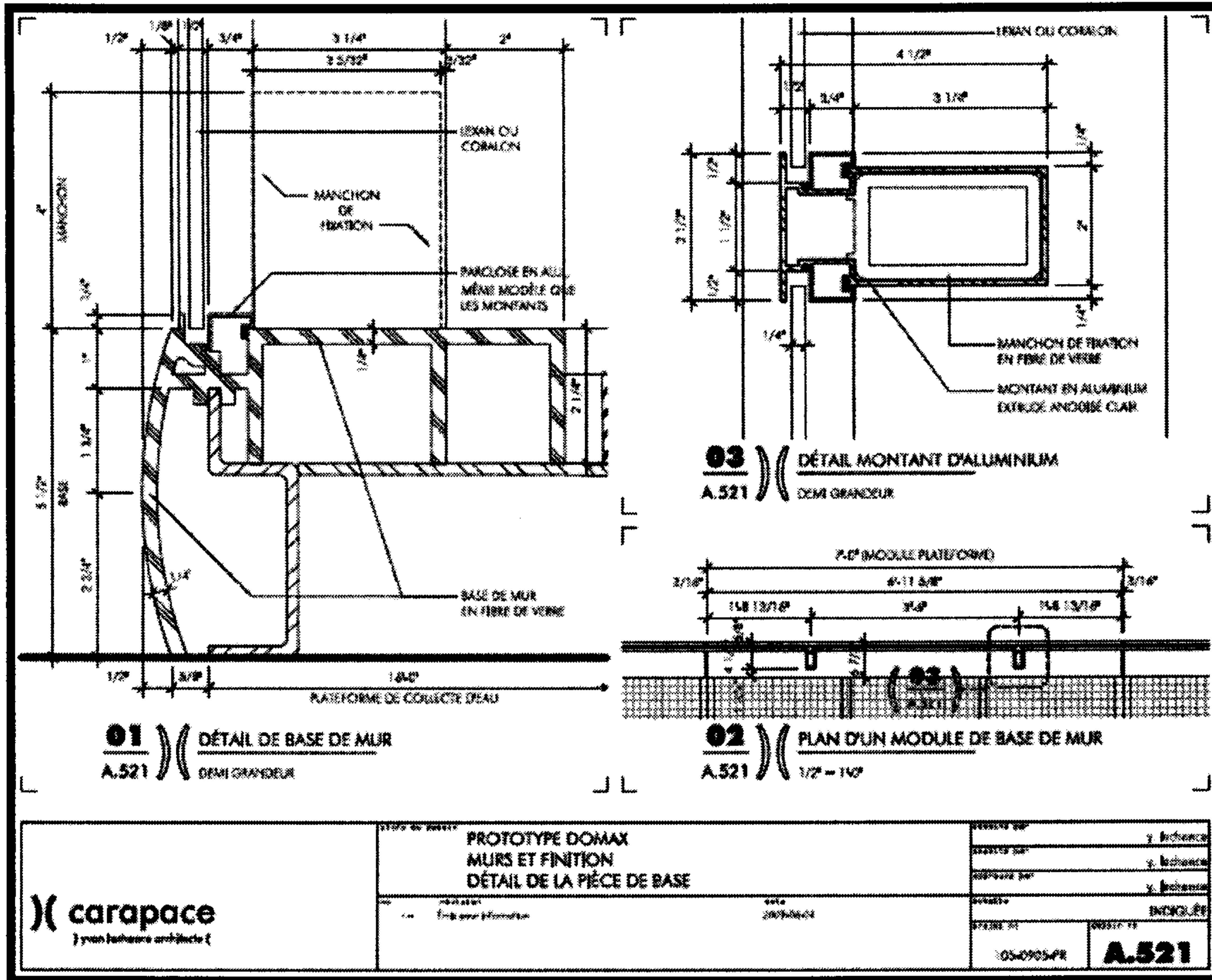








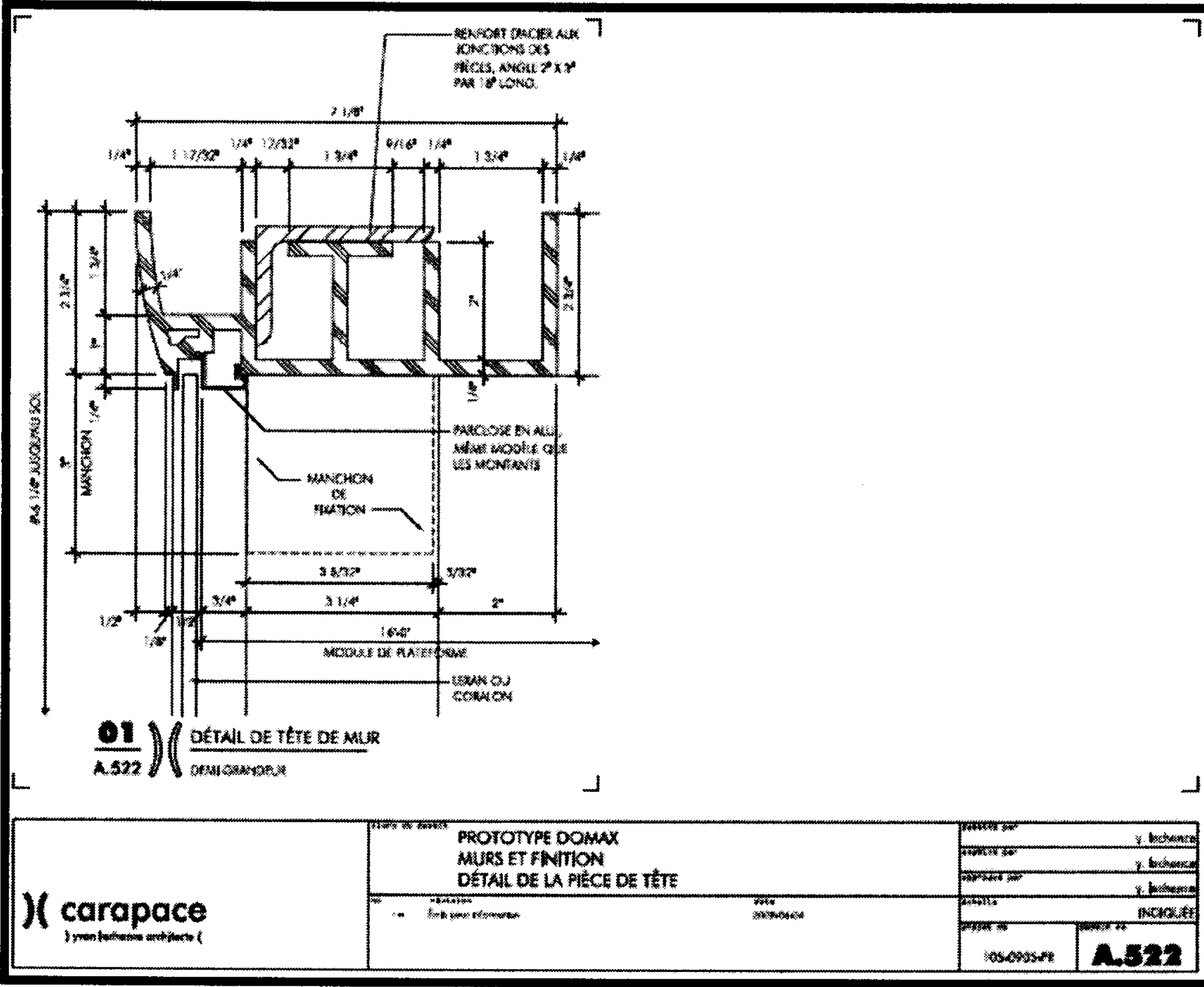




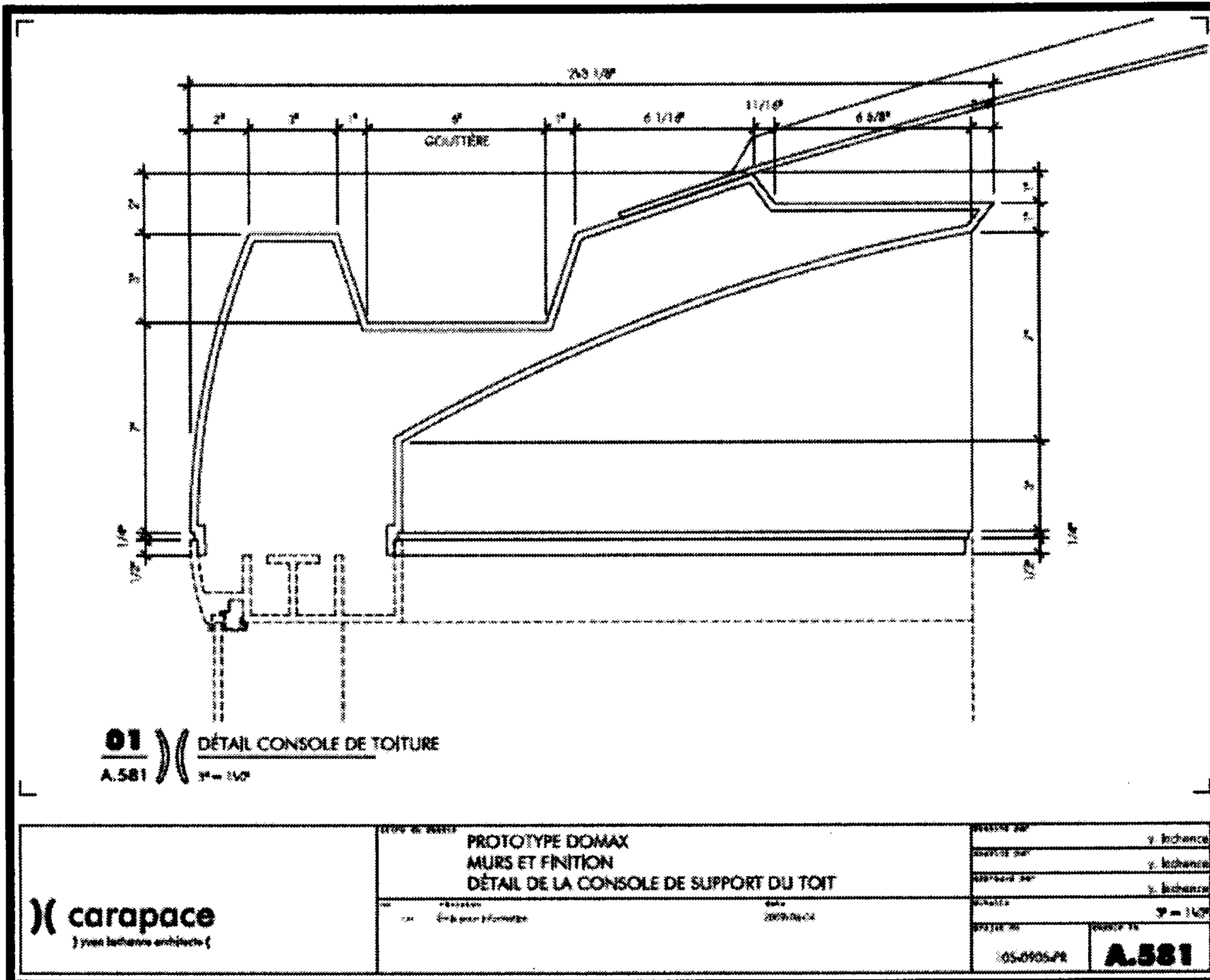
carapace
| yvon bahance architecte |

PROTOTYPE DOMAX
MURS ET FINITION
DÉTAIL DE LA PIÈCE DE BASE

dessiné par	y. bahance
dessiné par	y. bahance
dessiné par	y. bahance
dessiné par	INDIQUÉE
05-0905-PR	A.521



<p>carapace) your business architect (</p>	PROTOTYPE DOMAX MURS ET FINITION DÉTAIL DE LA PIÈCE DE TÊTE	RÉVISÉ PAR y. lehenne APPROUVÉ PAR y. lehenne RÉVISÉ PAR y. lehenne DATE 02/06/04 ÉCHELLE 1/2
	ÉLÉMENT	INCLUSE
	105-0905-F2	A.522
	105-0905-F2	



DRAWINGS: Filtering system

